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U. S. Asks for Larger Quantities of Paper

Bids To Be Opened May 24 Ask For 78,450,000 Pounds For Three Months Period As Compared With 115,545,000 Pounds For Previous Contract Period Of Six Months—Varieties Of Paper Wanted.

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., May 12, 1943—The Joint Congressional Committee on Printing has announced that it will receive bids on May 24 for paper for the use of the Government Printing Office for a three months period beginning July 1. For the three months period bids are being asked for 78,450,000 pounds as compared with bids asked during the present six month contract period for 115,545,000 pounds.

Quantities Needed

Bids are being asked for the three months period for the following:

2,500,000 pounds newsprint paper.
200,000 pounds telephone book news,
3,860,000 pounds machine-finish book paper.
100,000 pounds antique book paper.
4,020,000 pounds off-set book paper.
90,000 pounds lightweight machine-finish book paper.
150,000 pounds 50% antique book paper.
15,000 pounds 75% laid antique book paper.
3,800,000 pounds supercalendered book paper.
750,000 pounds machine-coated book paper.
400,000 pounds coated book paper.
40,000 pounds lithograph paper.
3,400,000 pounds mimeograph paper.
300,000 pounds U S M O safety writing paper.
4,000 pounds U S M O writing paper.
21,400,000 pounds writing paper.
4,840,000 pounds map paper.
2,740,000 pounds manifold paper.
11,219,000 pounds bond paper.
2,602,000 pounds ledger paper.
3,570,000 pounds index paper.
490,000 pounds cover paper.
790,000 pounds manila paper.
700,000 pounds kraft paper.
1,000,000 sheets gummed paper.
120,000 pounds blotting paper.
30,000 pounds high-finish red sulphite.
150,000 pounds manila tag board.
1,100,000 pounds calendered tag board.
250,000 pounds jute tag board.
100,000 pounds manila cardboard.
390,000 sheets railroad board.
650,000 pounds bristol board.
4,500,000 pounds postal card bristol.
60,000 sheets pressboard.
1,200,000 pounds news board.
920,000 pounds binder's board.

In cases where more than 1,000 reams are called for, proposals will be received for 1,000 reams or more.

Specifications Report

Following is the official report of the Paper Specifications Committee to the Joint Congressional Committee on Printing.

The Committee on Paper Specifications respectfully submits its Forty-Sixth Report and the accompanying recommended schedule for paper for the public printing and binding and blank paper for the use of the Government departments and establishments in the District of Columbia for the term of 3 months beginning July 1, 1943.

Several changes have been made in the Instructions: Paragraph No. 26 was modified to effect a slight change in meaning; paragraph No. 41 has been amended to include a clause requiring full tests and certification of all paper; paragraph No. 69 has been amended to give instructions on memorandums where shipments are made to destinations other than the Government Printing Office, Washington, D. C.; in paragraph No. 76 the specified time of delivery has been changed from 30 days to 15 days; paragraph No. 91 has been expanded to include the new regulations under the Walsh-Healey Act; paragraph No. 92 covers the overtime wage compensation and minimum wartime workweek; former paragraph No. 92 has been renumbered paragraph No. 93.

The specifications for stock have been changed in a number of cases. Sixty per cent of unbleached chemical wood pulp and 10 per cent of ground wood pulp are now permitted in lots 3-10, 18, 22, 23, 55-60, 101, and 252. "Unbleached pulp" was changed to read "unbleached chemical wood pulp" for stock in the lots where a definite percentage of unbleached pulp is permitted. This clarifies the specification so that the ground wood pulp is not considered as a part of the percentage of unbleached pulp. An increase

(Continued on page 30)

Paper Supply Situation Tighter in Chicago

Demand Continues Heavy But Manpower and Transportation Difficulties Make Deliveries Increasingly Uncertain—Equal Pay Bill For Women Introduced—Safety Conference Meets—Other News.

[FROM OUR REGULAR CORRESPONDENT]

CHICAGO, Ill., May 10, 1943—The first week of May gave no indication here of any let up in the "two way" problem involving the paper industry. Demand was as heavy as ever and the perplexities emanating from the shortages of materials, the manpower situation and transportation shortage, continued to force order "backlogs" into a tighter position.

The campaign to demonstrate the end use value of paper was reported here as having some helpful effects but it was indicated that by no means sufficient punch had as yet been applied to protect the paper industry from very dangerous repercussions. Groundwoods and newsprints showed renewed strength during the week with the former having a gala time demonstrating its "all-purpose" use as one distributor expressed it. Krafts were likewise strong with more and more uses being developed for paper and military requirements becoming even more exhaustive. Sulphite representatives here reported a further dropping behind in fulfillment of orders while specialties were also much tighter as the man power and material problem increased. Books and covers were strong while waste paper markets were finding the supply a bit more encouraging due to better weather and slight improvement in man power problems.

Printing Firm Boosts "Essential" Theme

A big boost to the campaign to demonstrate the essentiality of paper in war time comes from the Miehle Printing Press and Manufacturing Company of Chicago, through the medium of a sound slide film "Printing for Victory" which has been released to graphic arts trade groups. The film is of an educational and inspirational nature and takes 15 minutes running time. It begins with the use of printed advertising on the battle front as a weapon of war in planning strategy and shows the value of the printed propaganda program in this War. There is a real dramatic quality about the presentation of the vital wartime role of printing on all war fronts—on the production and home fronts as well as on the battle front. It even features an appeal from official Washington for help in bringing campaigns to the homes of millions of people. It has created such a favorable impression in this area that certain paper executives are wondering why the paper trade associations do not develop a similar film with an out-and-out appeal for recognition of the importance of paper as a real "weapon" in war time and on the home front as well.

Fear Effects of "Equal-Pay" Legislation

Illinois employers had their headache this week from a new quarter. It came from the surprising revival of an "equal pay for women" bill which appeared in the Illinois Senate after having been sent to a House sub-committee earlier in the week. The bill proposes that there shall be no discrimination in pay between men and women for "substantially the same quality, quantity and character of work." It provides that the Department of Labor shall have the power to inspect payrolls, records and procedure to determine what is "substantially, etc." It then provides the way for court action and sets up severe penalties for violators. The paper trade industry here, using more and more women in its operations, feared not the principle of equal pay but the jeopardy of the law feature and the continued regimentation of industry in war time with a brand new experiment. If passed, the measure was expected to discourage the use of women, develop a very dangerous inflationary trend, work to the detriment of women employees after the War is over and open the way to more arduous government control. It is expected that final hearings will be held on the bill—Senate Bill 368—this week. Members of the printing industry have actively appeared in hearings in opposition to the measure.

The twenty-first annual Midwest Safety Conference and Exposition held in Chicago this week was well attended by paper mill executives and representatives of allied trades. The three day session included the presentation of educational exhibits which featured the war time necessity of accident prevention and described as "War For Number One." A key address by Governor Green of Illinois included the statement that "accidents have been a greater blow to the American war effort than the Japanese stab in the back at Pearl Harbor." His forceful pronouncements, expected to be widely used by the safety groups, pointed out that the loss to the American war effort through injuries had totaled 460,000,000 man days and that the loss of manpower killed in industry occupation represented sufficient labor to build 20 more battleships, 100 destroyers, 9000 bombers and 40,000 tanks. The Governor urged more study and more hard work.

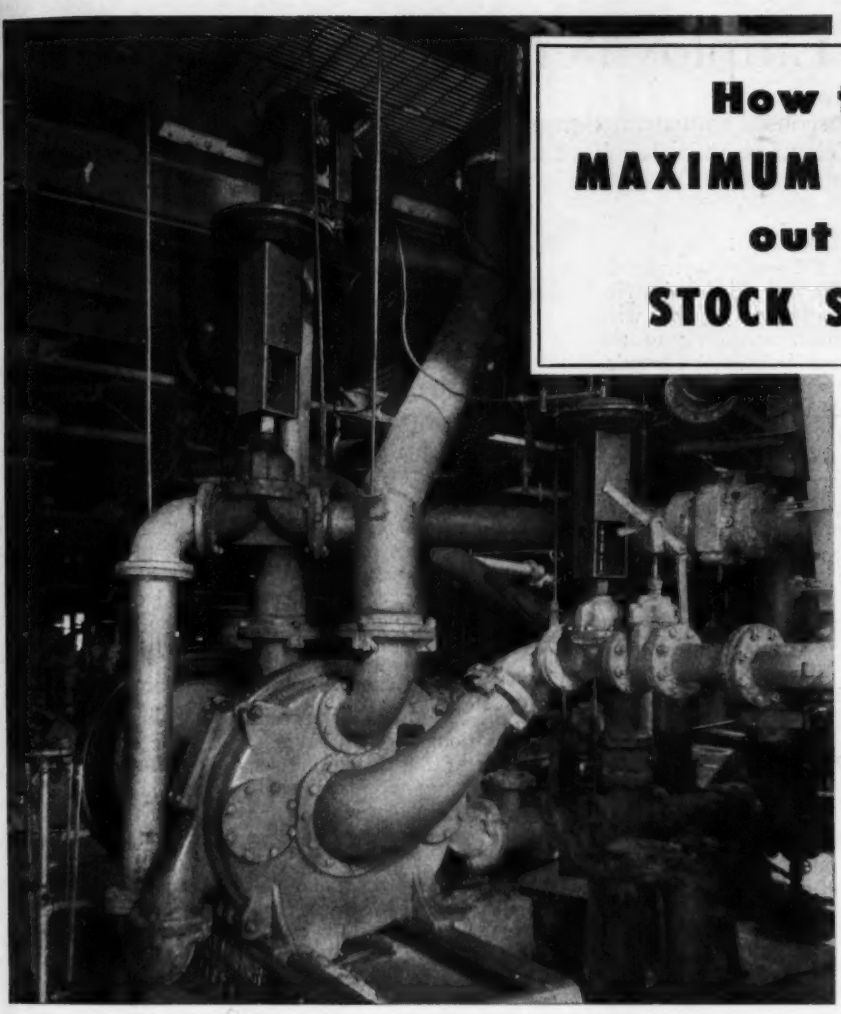
N.P.T.A. President Recovering

Corwine E. Roach, president of the Capitol City Paper Company of Springfield, and recently elected head of the National Paper Trade Association, was reported this week to be making encouraging recovery following his very severe illness. Mr. Roach was said to be "a very sick man" but his recovery was faster than expected according to Springfield friends. It will be some time before he can take up his many duties in the association and civic world.

Issues Pulpwood Prices

The OPA issued on May 4 specific price ceilings on pulpwood produced in South Carolina, Georgia, and Florida. The 60-day freeze on prices established March 5 in the whole southeastern district, was made permanent without changes for the nine other states in the district, which include Kentucky, Virginia, North Carolina, Tennessee, Alabama, Louisiana, Texas, Arkansas, and Mississippi.

All pulpwood produced in South Carolina, Georgia, and Florida, now has the following ceiling prices, per cord, f.o.b. car or barge: Southern Pine, $6.80; Rough Southern Hardwoods, $7.30; and Peeled Southern Hardwoods, $10.00.



How to get MAXIMUM EFFICIENCY out of a STOCK SELECTOR

With the Taylor Flex-O-Timer timing the control valves, operators are getting high efficiency and low maintenance costs with the new Dilts Classifiner.

THE picture above shows one of the latest developments in stock selectors. One reason it performs so efficiently is the valve control system worked out by Taylor Instrument engineers.

The manufacturer was faced with a serious problem in maintaining a uniform schedule of valve operations in the rejected-stock lines from the machine—also in keeping the reject valves in good operating condition.

Taylor Engineers solved the problem with a standard timing control, the Taylor *Flex-O-Timer,* which acuates the Saunders type reject valves by means of standard Taylor Motosteel Diaphragm Motors.

As a result, the installation shown here is handling the required tonnage with a high degree of efficiency. It is also reducing costs in two ways—by saving the operator's time and by greatly reducing maintenance on the two important control valves.

Obviously, Taylor couldn't have worked out this application so successfully without a good many years of experience and research in the pulp and paper field. This experience is yours for the asking. The Flex-O-Timer setup shown here, for example, can be applied with equally good results to other types of stock selectors. Ask your Taylor Field Engineer, Taylor Instrument Companies, Rochester, N. Y., and Toronto, Canada. Instruments for indicating, recording, and controlling temperature, pressure, humidity, flow, and liquid level.

Taylor Instruments
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ACCURACY FIRST
IN HOME AND INDUSTRY

★ KEEP ON BUYING U. S. WAR BONDS AND STAMPS ★

Paper Mill Employment Continues Steady

Report of Wisconsin Industrial Commission Shows No Employment Change in February and March—Lumber Co. Sold by Paper Mill Group—Report Shows War Drain on Pulpwood—Other News.

[FROM OUR REGULAR CORRESPONDENT]

APPLETON, Wis., May 10, 1943—Employment in Wisconsin paper and pulp mills and allied industries was the same for both February and March, with 23,200 workers on the payrolls, according to the monthly report of the Wisconsin Industrial Commission. The number is 3.7% less than in March, 1942, when the workers numbered 24,100.

Average weekly payrolls showed a decline of 0.3%, dropping from $832,000 to $829,000, although up 5.6% from March of last year, when workers were receiving $785,000. The average number of hours worked per week dropped from 44.3 hours in February to 43.8 in March, but the average hourly earnings increased from 80.8 cents to 81.5 cents. Weekly pay checks averaged $35.72.

In the Milwaukee metropolitan area employment went up 1.0% to 2,060 workers, with average weekly payrolls up 2.1% to $76,880. The work week averaged 47.3 hours for March, with pay checks of $37.32 at 79 cents per hour.

Lumber Co. Sold By Paper Group

The Yawkey-Alexander Lumber Company, Schofield, Wis., organized in 1935 by officers of the Wausau Paper Mills Company, Brokaw, Wis., has been sold to the Roddie Lumber and Veneer Company, Marshfield, Wis. The mill had been operated by the paper group to saw logs unsuited for pulpwood, taken from the company's large timber tract in Lincoln County, Wis.

Officers of the Yawkey-Alexander company included Ben Alexander, chairman of the board, who is president of the Masonite Corporation and board chairman of the Wausau Paper Mills Co.; Harold C. Collins, president and also president of Wausau Mills; A. P. Woodson, secertary-treasurer, who is president of the Mosinee Paper Mills Company and secretary of the Wausau Mills.

Report Shows War Drain on Pulpwood

Extent of the wartime drains on the pulpwood and timber supply, far exceeding the natural replenishment, is shown by a report prepared by the northern lakes states regional committee, made up of representatives from Wisconsin, Michigan and Minnesota. The committee was chosen several years ago as a part of the National Resources Committee planning program. It was delegated to prepare a report on the resources and possibilities of rehabilitation of the 57 million acres in the cut-over region.

"In northeastern Wisconsin and upper Michigan," says the report, "depletion is almost twice the rate of annual growth. The situation in the merchantable pulpwood stands is very similar to that in the saw-timber areas. Depletion of high grade spruce exceeds growth by a large margin, but balsam and Jack pines are more nearly in balance. There remains a surplus of aspen for pulp use.

"Accelerated wartime cutting has caused further disparity between growth and drain, reducing further the basic growing stock on which growth is laid and extending farther into the future the time when full forest production can be exported."

Another section of the report says:

"The climax to nearly a century of intensive exploitation followed by fires is a situation in which little more than 10% of the forest land contains commercial saw timber, 20% in cordwood stands only a part of which is merchantable, and the remainder is covered either with a very young growth or is deforested."

The current report will be submitted to the National Resources Committee in Washington. It discusses all the economic resources of the region and the probability of their expansion and development, but concludes that the basic hope for the future in the big territory lies in timber.

S. F. Shattuck Appointed to Committee

S. F. Shattuck, vice-president of Kimberly-Clark Corporation, Neenah, Wis., has been appointed a member of the committee set up by the War Manpower Commission for what will be known as the Madison-Fox River Valley area, according to announcement of Dean William H. Spencer, Chicago, regional director. Mr. Shattuck will be one of the representatives of management. Among the labor representatives is Joseph Siebers, Local 147 (AFL) of the Thilmany Pulp and Paper Company, Kaukauna, Wis.

The committee will advise and assist in carrying out the Washington and regional manpower policies at the area level to fit the area's requirements. Every man and woman who can do useful work in the war effort will be utilized at his or her highest level of skill through efforts of the committee, working with A. A. Holly, special representative.

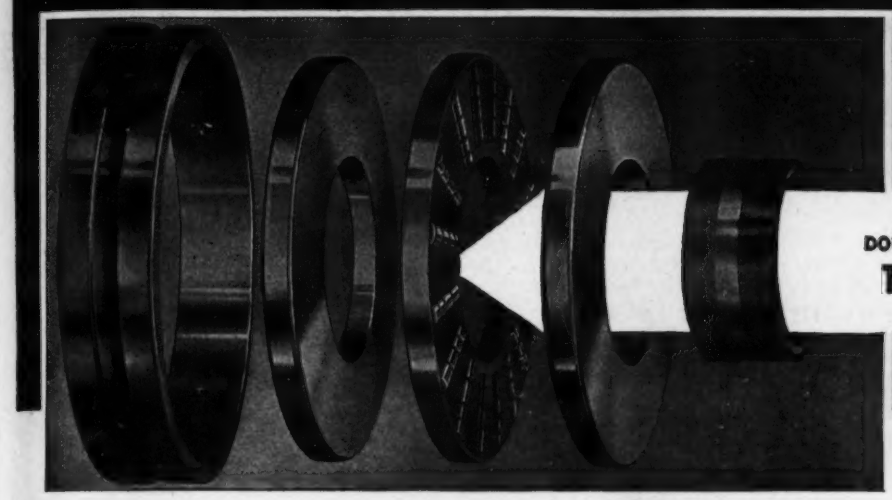
Jay Wallens Appointed to Pricing Board

Jy Wallens of the Riverside Paper Corporation, Appleton, Wis., has been appointed a member of the war price and rationing board of Outagamie County. He will serve on the board's new price panel to disseminate information on regulations.

Retiring Superintendent Honored

Earl R. Brown, who retired last week as superintendent of the Bergstrom Paper Company, Neenah, Wis., after serving for 29 years, was presented with a gold watch during a dinner in his honor Saturday evening May 1, at the Valley Inn., Neenah. More than 200 officials and employees attended. The presentation was made by Nathan H. Bergstrom, vice-president and secretary, who acted as toastmaster. Girls employed in the office presented him with a chain to go with the watch. He also received as gifts from the employees a Masonic ring and an album of pictures of all the Bergstrom company officials since its incorporation in 1904, and of the early employees with whom Mr. Brown was associated.

When Every Machine Must Do 3 Machines' Work!



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hold "down time" losses to a minimum . . .

For longer bearing life, more efficient performance and more economical maintenance . . .

FOLLOW THIS BASIC BEARING PRINCIPLE

- All radial loads carried at right angles to the roller axis.
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Not one shift, not two shifts, but THREE SHIFTS A DAY! That's the three-machine load your equipment must handle today. No wonder bearing wear increases. No wonder old-time service factors fail to predict bearing life. But even with this tripled operating time, there's a way to carry bearing loads that will make your bearings stand up longer. Here's the fundamental principle to follow:

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Because they carry every load at right angles to the roller axis, Rollway Right-Angle Bearings split the load into its two simple components of *pure radial* and *pure thrust*. Only one of these loads is carried by a single bearing assembly. There are no oblique resultants, no compound pressures on the rollers. Magnitude of the stresses is considerably reduced. Life of the bearing is substantially increased. And machines can be run under heavier loads for longer periods.

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S.A.E. or American Standard metric dimensions and tolerances are available for most applications . . . in a wide range of sizes and types that are "engineered to the job." Let Rollway's specialized bearing experience help you. Send your design or change-over specifications for free, confidential bearing analysis and recommendation. No obligation.

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BUILDING HEAVY-DUTY BEARINGS SINCE 1908 — **BEARINGS**

Hold Ladies' Nite at Kalamazoo

KALAMAZOO, Mich., May 10, 1943—The Michigan Division of the American Pulp and Paper Mill Superintendent's Association held their 11th annual Ladies' Night dinner and dance Saturday evening, May 1, 1943, at the Park American Hotel with 120 present. Repeating the custom instituted two years ago the party began with a cocktail hour in the Mirror Room adjacent to the main dining room, where the superintendents, their wives, and guests spent a pleasant interval preceding dinner.

Harry Eliason Is Toastmaster

At the close of a very satisfactory dinner for which Manager Bill Sanders is famous, Albert Perlick, chairman of the Division, greeted the gathering and turned the program over to the toastmaster. In the past on these occasions, the committees on management have always exhibited uncanny judgment in their selection of the toastmaster and this year was by no means an exception. Their choice of Harry D. Eliason, the genial representative of the Cellulose Sales Corporation, was a "natural" and he took over with the ease of a veteran snapping the program along like a professional M. C.

Winners of Door Prizes

The winners of the door prizes were announced, the lucky individuals being Mrs. Alfred Perlick, Olin Callighan and Len Breyfogle. The following distinguished members and guests were introduced, Ed Coughlin, past national president of the association; Ray L. Barton, present first vice president who spoke briefly regarding the National convention being held in New York in June; Ed Thom who came down from Montreal to attend the dinner; Allen Milham president of the Bryant Paper Company; Glen Graham, vice president of the Sutherland Company; L. H. Breyfogle and R. B. Stewart, who hold life memberships; Frank B. Eilers and the officers of the Michigan division; Messr. Perlick, Sutton, Atkins and Waber. The outstanding member of the floor show was put on by Sam Shire of the K.V.P., who showed his illustration of "Gremlin Photography." All members of the association received their share of ribbing in this stunt. Dancing was later enjoyed until one a.m.

Chairman Perlick was assisted in arranging the party by Glen Sutton, Ralph Atkins and Joe Waber, the program committee consisted of O. W. Callahan, L. H. Breyfogle, C. "Baldy" Smith, M. S. Fogerty and Fred Hodgemire with Frank Eilers and Ray Barton committee men at large. Roy Holden and Jack Dickson had charge of the cocktail party, and contributed the proper degree of dignity for that part of the occasion.

Sponsors of Cocktail Hour

The sponsors of the cocktail hour were: Howard Smith Paper Mills, Ltd.; American Wire Cloth Company; Williams Gray Company; Douglas Robbins Company; Stowe Woodward Company; Orr Felt and Blanket Company; American Cyanamid and Chemical Company; R. T. Vanderbilt Company; Joseph Longhead Company; Wyandotte Chemical Corporation; Noble & Wood Company; A. E. Woollam Company; Staley Sales Corporation; Penick & Ford, Inc.; Heller and Merz Corporation; Draper Brothers Felt Company; U. S. Rubber Company; Edgar Brothers Company; Cameron Machine Company; Kalamazoo Tank and Silo Company; Gus Riedel & Sons; Philadelphia Felt Company; Herman Mount Company; Beloit Iron Works; National Aniline and Chemical Company; Simons Worden, White Company; Hooker Electrochemical Company; Howell Murchison, Inc.; Albany Felt Company; Hercules Powder Company; Bulkley Dunton Company; General Dye Stuff Corporation; Weyerhauser Timber Company; Pioneer Paper Stock Company, and Cellulose Sales Corp., Inc.

Those in Attendance

The party was attended by the following:

Mr. and Mrs. Wm. H. Astle, Michigan Paper Company; Mr. Ralph Atkins, Lee Paper Company; Mr. Norman Bardeen, Lee Paper Company; Mr. and Mrs. Raymond L. Barton, Michigan Paper Company; Mr. L. H. Breyfogle, Draper Brothers Company; Mr. and Mrs. Robert Buss, Hercules Powder Company; Mr. and Mrs. Olin W. Callighan, Edgar Brothers Co.; Mr. and Mrs. W. J. Cassidy, Hawthorne Paper Company; Mr. and Mrs. Murray Chamberlin; Mrs. Pauline Clow; Mr. and Mrs. A. W. Cole, Rex Paper Company; Mr. and Mrs. E. T. A. Coughlin, Bryant Paper Company; Mrs. Walter Crawford; Mr. Wayne E. Crotty, Bryant Paper Company; Mr. J. A. Deane, Michigan Paper Company; Mr. and Mrs. Lawrence DeLeeuw, Mr. and Mrs. Jack Dickson, R. T. Vanderbilt Company; Mr. and Mrs. Arthur G. Dreis, Hercules Powder Company; Mr. Homer Eaton, Wyandotte Chemicals Corporation; Mr. and Mrs. Frank B. Eilers, Orr Felt and Blanket Company; Mr. and Mrs. Harry D. Eliason, Cellulose Sales Corporation.

Mr. and Mrs. Otto F. Fisher, Bryant Paper Company; Mr. and Mrs. L. E. Fitzgerald, Hercules Powder Company; Mr. and Mrs. Glen E. Graham, Sutherland Paper Company; Mr. and Mrs. Hod Heath, Rex Paper Company; Mr. and Mrs. Thos. Hennessey, Otsego Falls Paper Mills; Mr. George A. Hermann, Hermann Manufacturing Company; Mr. and Mrs. Wm. Herring, Parchment Sales Company; Mr. and Mrs. Fred Hodgemire, Hawthorne Paper Company; Mr. and Mrs. R. W. Holden, Stowe-Woodward, Inc.; Mr. and Mrs. Dave Klausmeyer, Illinois Envelope Company; Mr. and Mrs. A. R. Kloosterman, Hercules Powder Company; Mr. and Mrs. Lester H. LaLiberte, Kalamazoo Vegetable Parchment Company; Mr. and Mrs. R. A. Lane, Sutherland Paper Company, Mr. and Mrs. Lloyd J. Lynd, Michigan Paper Company; Mr. and Mrs. R. T. Mashburn, Hercules Powder Company; Mrs. Joseph Maur; Mr. A. B. Milham, Bryant Paper Company; Mr. and Mrs. L. M. Mongreig, U. S. Rubber Company; Mr. and Mrs. Henry Nendorf, Rex Paper Company; Mrs. Ira O'Dell.

Mr. and Mrs. Harry Pearson, Pioneer Paper Stock Company; Mr. and Mrs. A. B. Perlick, Kalamazoo Vegetable Parchment Company; Mr. and Mrs. C. W. Povenz, Crescent Engraving Company; Mr. and Mrs. George H. Rice, Kalamazoo Vegetable Parchment Company; Mr. A. Wm. Riedel, Gus Riedel

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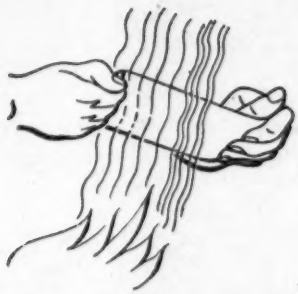

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May 13, 1943

& Son; Mr. and Mrs. T. R. Rock; Mr. and Mrs. John G. Ruimveld, Rex Paper Company; Miss Maxine Schays; Mr. and Mrs. Frank F. Schmiege, American Wire Cloth Company; Mr. Paul Schreiber, General Dyestuff Corporation; Mr. Walter L. Shaw, Heller & Merz; Mr. and Mrs. Al Sherwood, Sutherland Paper Company; Mr. and Mrs. George Shinners, American Wire Cloth Company; Mr. and Mrs. Sam Shire, Kalamazoo Vegetable Parchment Company; Mr. Robert B. Stewart, Kalamazoo Vegetable Parchment Company; Miss Ann S. Stewart; Mr. H. E. Stratton, PAPER TRADE JOURNAL; Mr. and Mrs. Roman Suess, Otsego Falls Paper Mills; Mrs. Fred Sutherland; Mr. and Mrs. Carl W. Swanson, Allied Paper Mills; Mr. and Mrs. P. A. Talbot, R. T. Vanderbilt Company; Mr. and Mrs. E. B. Taylor, American Cyanamid and Chemical Corp.; Mr. and Mrs. W. S. Taylor, American Cyanamid and Chemical Corp.; Mr. Ed. J. Thom, Howard Smith Paper Mills; Mr. and Mrs. C. E. Van Buren, Albany Felt Co.; Mr. and Mrs. Carl Van Laaten; Mr. and Mrs. Joe Waber, Rex Paper Company; Mr. A. P. (Jack) Wandtke, Heller & Merz; Miss Mildred Winkelman and Mr. and Mrs. A. E. Woolam, A. E. Woolam Co.

Orders Withholding of Pulp

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., May 10, 1943—All producers of wood pulp have been ordered by the WPB to withhold 20% of their production of all types of wood pulp during the month of June and each month thereafter, and to make deliveries of such withheld tonnage only as ordered by WPB.

To assure the manufacture of adequate paper and paperboard to meet wartime demands from available wood pulp, the "withholding clause" of General Preference Order M-93 was invoked through the issuance of Supplementary General Preference Order M-93-a, effective yesterday.

This action was anticipated when the May pulp allocations were announced, in view of the shortage of several essential types of wood pulp, particularly unbleached kraft (sulphate), inventories of which grade of pulp are now reduced to a twenty-day basis.

The Pulp and Paper Division announced that in the allocation of wood pulp for June shipment it will be necessary to withhold pulp from less essential paper products in order to provide pulp for the manufacture of relatively more essential paper products and to meet Lend-Lease and Latin American obligations. Attainment of the WPB objectives may, in some instances, require the allocation of pulp from integrated to non-integrated mills where such action is deemed to be in the best interest of the war effort. It is not to be inferred, however, that the entire 20% withheld under order M-93-a will necessarily be diverted away from the operations of each integrated mill, because in many cases all or most of the withheld wood pulp will be allocated back to the producer.

In the case of market mills, the 20% withholding provision will require that they refrain from scheduling this amount to consumers. The WPB may allocate this tonnage fully when returning Form PD-292 to the pulp producers, or it may leave some portion for interim emergency allocations during the delivery month. In any case, producers will receive instructions as to the disposal of withheld tonnage in ample time for them to plan their deliveries accordingly.

While the wood pulp shortage has reached the point where it is deemed necessary to invoke the withholding clause of Order M-93, the power to allocate such withheld tonnage will be used only to provide for the safeguarding of production which is considered important to the war effort.

John G. Strange Leaves WPB

WASHINGTON, D. C., May 10, 1943—The resignation of John G. Strange as Chief of the War Products Development Section, Pulp and Paper Division, War Production Board, has been announced by A. G. Wakeman, Director of the Division. Mr. Strange, who set up the War Products Development Section and has acted as its chief ever since, will be succeeded by R. J. Zaumeyer, of Neenah, Wisconsin.

Mr. Strange will return to his duties as Secretary of the Institute of Paper Chemistry, at Appleton, Wisconsin, but will continue to serve as a consultant to the section on the development of some of the forty special paper projects designed to meet war requirements, many of them undertaken with the cooperation of the armed services. Mr. Strange was also instrumental in effecting more adaptable specifications for many normal commercial paper products.

Mr. Zaumeyer, the new section chief, is associated with Kimberly-Clark Corporation, a large pulp, paper and creped wadding manufacturing company of Neenah, Wisconsin.

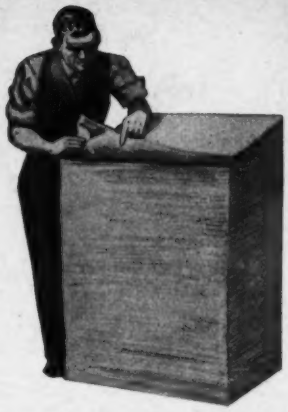
Other changes in personnel included the appointment of R. C. Spencer of the Lowe Paper Company of Ridgefield, New Jersey, as Deputy Chief of Section, replacing Herman Whitmore, who returns to active duty with the Robert Gair Company of New York. W. H. Swanson, another member of the section, resigned after completing his temporary service to resume his activities with the Kimberly-Clark Corporation at Neenah, Wisconsin.

Paper Men on Advisory Committee

WASHINGTON, D. C., May 12, 1943—The WPB has announced the establishment of a Distributors Industry Advisory Committee with Charles W. Boyce as Government Presiding Officer. The members of the Committee include the following: N. A. Altman, Butler Paper Company, Chicago, Ill.; J. C. Campbell, Industrial Paper and Cordage Company, Pawtucket, R. I.; Walter G. Cleveland, E. C. Palmer, Ltd., New Orleans, La.; W. N. Gillett, Chicago Paper Company, Chicago, Ill.; Francis W. Howe, Hubbs & Howe Company, Buffalo, N. Y.; E. G. Kerwin, Graham Paper Company, St. Louis, Mo.; A. W. Leslie, John Leslie Paper Company, Minneapolis, Minn.; E. P. Magel, Crescent Paper Company, Indianapolis, Ind.; W. N. Stetson, Storrs-Bement Company, Boston; S. S. Weil, J. Weil & Sons, Inc., Chicago, Ill.; S. L. Wellhouse, National Paper Company, Atlanta, Ga.; Harold L. Zellerbach, Zellerbach Paper Company, San Francisco, Cal.

Paper and Type Nets $2.05

The National Paper and Type Company and subsidiaries for the six months to February 28, reports net profit after $50,000 special reserve, taxes and other charges was $150,797, or $2.05 each on 64,392 common shares. This compares with $212,196, or $3.01 a common share, for six months to February 28, 1942.



DIAMOND ALKALI IN THE PAPER INDUSTRY

Many Diamond Alkali products are employed in the manufacture of paper. For example, Diamond Soda Ash and Caustic Soda are used in digesting certain pulps and in de-inking operations, Diamond Liquid Chlorine in bleaching and slime control, while other Diamond products such as Calcium Carbonate and Silicate of Soda are used in substantial quantities by paper manufacturers.

Being a high speed, continuous process, temperatures and speeds must be under complete control, and all materials uniform and dependable.

The dependability of Diamond products helps increase production, reduce costs, improve quality.

Diamond Soda Ash and Caustic Soda are used in digesting pulpwood chips.

ALKALI

CONSTRUCTION NEWS

Under limitations order L-41 all projects involving expenditures of more than $5000 must be specifically approved by the War Production Board. The status of projects reported herewith under the provisions of the order is not known.—EDITOR.

Chicago, Ill.—The M. B. Cook Company, 508 South Dearborn street, manufacturer of carbon paper and other processed paper stocks, etc., has arranged for removal of plant to building at 600 West Van Buren street, where about twice the amount of floor space will be occupied for expansion. Additional equipment and facilities will be provided for that purpose. At the same time, company has authorized a change in name to Panama-Beaver, Inc. Charles J. Leonard is president. Company is a division of Manifold Supplies Company, first noted address.

Savannah, Ga.—The Union Bag and Paper Corporation, manufacturer of kraft wrapping papers, paper board specialties, has plans maturing for construction of a new wharf in Chechessee Creek on Spring Island, Beaufort County, S. C., to be about 12 feet wide and 60 feet long, with mooring dolphin and other shipping facilities. It will be used in connection with pulpwood supply for mill at Savannah. Application has been made to War Department for permission to build the structure and work is scheduled to be placed under way as soon as this is secured.

Newark, N. J.—Ringel Brothers, 717 Broadway, Newark, manufacturers and distributors of paper and paper board products for commercial service, have acquired a two-story building on local site at 397-405 Elizabeth avenue, and will use in connection with operations. Property has been purchased in name of Hermax Corporation, a holding company for the Ringel organization. It is proposed to remove to new location at early date, expanding present capacity.

St. Louis, Mo.—The Hammer Dry Plate & Film Company, 3533 Ohio avenue, manufacturer of processed photographic papers, films, etc., will carry out a large expansion program in connection with certain improvements in plant, recently referred to in these columns, to provide for large increase in present capacity. Work will include a new building at Ohio avenue and Miami streets, for general manufacture, and a new structure for storage and distribution service. Extensions and improvements also will be made in power house at plant, including boiler and engine departments, with installation of additional equipment. Entire project is reported to cost close to $150,000, including equipment. General erection contract has been awarded to A. H. Haeseler Building and Contracting Company, 2346 Palm street, St. Louis, and work will be placed under way at once. Daniel Dohm, Jr., 7358 Milan street, St. Louis, is architect for new buildings.

Brooklyn, N. Y.—The Allen Paper Box Company, a new concern in the city, has leased space in building at 30 Maujer street, and will occupy for plant for manufacture and distribution of paper boxes and containers of various kinds.

St. Paul, Minn.—The Groff Paper Company, 1049 Raymond avenue, manufacturer of paper specialties, commercial paper stocks, etc., has approved plans for alterations and improvements in converting plant, consisting primarily of interior work. No estimate of cost announced, General contract has been awarded to Kraus-Anderson, Inc., 511 South Seventh street, St. Paul, and work will be placed under way at once.

Milwaukee, Wis.—The Milwaukee Waste Paper Company, 2342 North Newhall street, waste paper products, has work under way on remodeling and improving a two-story building on local site at 1742 Palmer street, recently acquired, as previously noted in these columns, and expects to occupy the structure for storage and distribution at early date.

Cincinnati, Ohio—The American Can Company, Spring Grove avenue and Fergus street, manufacturer of fiber and metal containers, has approved plans for a one-story addition to local plant, to be used, it is understood, for expansion in fiber box division. It will consist of a top story on a present four-story factory building, and is reported to cost over $40,000 with equipment. General erection contract has been awarded to Ferro Concrete Construction Company, 203 West Third street, Cincinnati.

Newark, N. J.—The Newark Paraffine and Parchment Paper Company, 50 Jelliff avenue, manufacturer of waxed and other processed paper stocks, with mill at Pittston, Pa., is celebrating its fortieth anniversary in business. The company was founded in 1903 by Moritz Eisner, and is now headed by William J. Eisner, president. Company plant at Newark is given over to waxing and other finishing operations, and is now running on a full production schedule.

Kalamazoo TAPPI Discusses Resins

The Kalamazoo Valley Section of the Technical Association of the Pulp and Paper Industry met at the Columbia Hotel, Kalamazoo, Mich., on Thursday, May 6, 1943. Fred Elliott of the Michigan Research Laboratories presided as chairman. About 50 attended.

Harold Sinclair of the American Cyanamid and Chemical Company talked on "The Use of Melamine Resins in Paper," and J. V. Hunn of the Sherwin-Williams Company, Chicago, Ill., discussed "Alkyd, Phenolic and Urea Resins." R. G. Macdonald, secretary-treasurer of TAPPI was present and reported on current activities of the Association.

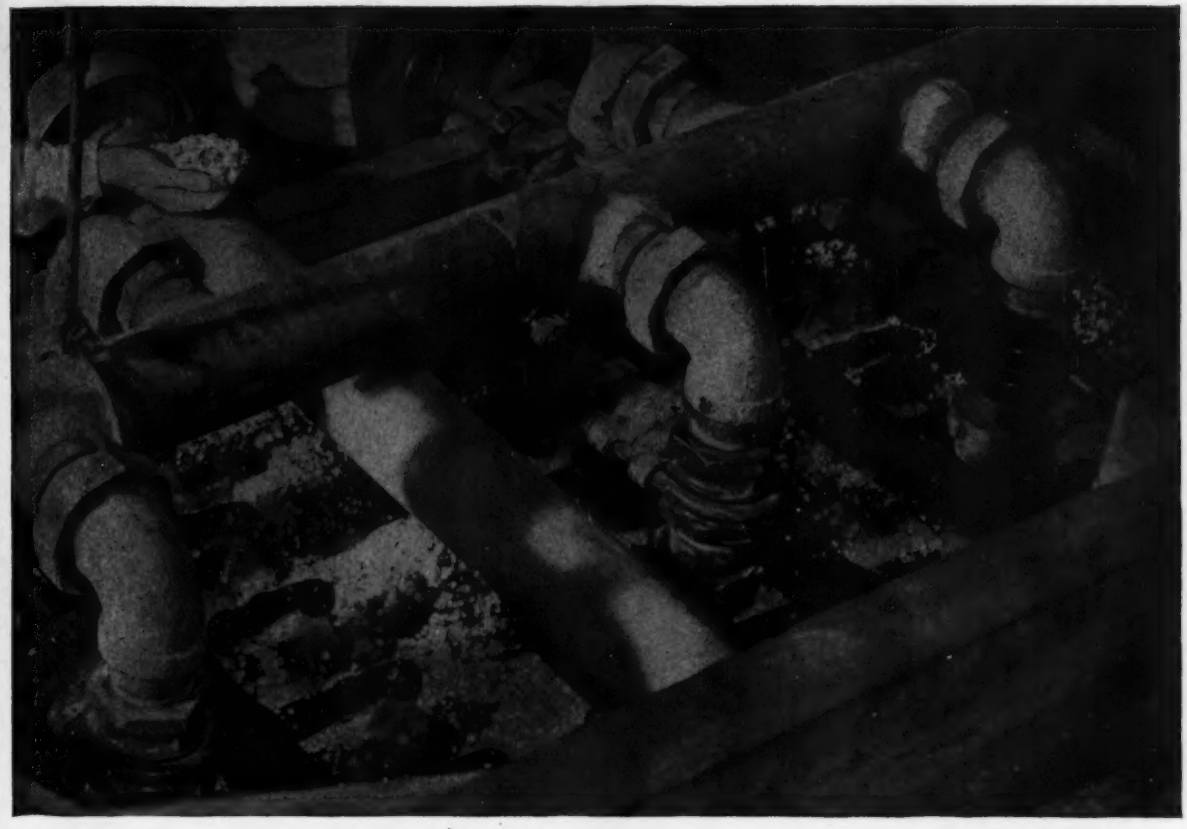
To Represent Kimpak in N. E.

BOSTON, Mass., May 10, 1943—The Kimberly-Clark Corporation has established Carter Rice & Co., Corporation, as the New England representative on Kimpak Products. This material is particularly adapted to the protective packaging of war-time products.

Goes with Carter Rice & Co.

[FROM OUR REGULAR CORRESPONDENT]

BOSTON, Mass., May 10, 1943—John Marsden has entered the employ of Carter Rice & Co., Corporation, as a salesman in the fine paper department.



OUT OF THESE FLOCS MAY COME THE FUTURE OF THE WORLD

These white crumbs or "flocs" look very unimportant in themselves . . . but on them may depend the future of the world. They are one of the first stages in the production of synthetic rubber, the most vital material being produced in America today.

Naturally, you are interested in synthetic rubber. But synthetic rubber is only incidental. What is really important is what happens to synthetic rubber after it is actually produced. It is chemistry that makes rubber fit to use, suits it to the task at hand.

United States Rubber Company is the largest manufacturer of rubber chemicals in the world. We have worked with rubber, improved it and broadened its uses for 100 years. Today, all this tremendous fund of knowledge of the chemistry of rubber is being drawn upon to improve synthetic rubber, perfect it for the jobs it must do for the Armed Forces and war industry.

The chemistry of rubber is what determines the final compounding and processing of the flocs of synthetic rubber you see here. They may eventually go into bullet-sealing hose, air ducts, or any one of a score of other parts used in the plane that will blast the last Nip carrier off the sea. They may be made into a tire that will rumble down bomb-battered Unter den Linden. They may go into some essential equipment like a conveyor belt that will keep America's war production line moving at top speed. They might very easily determine the entire course of the war, and thereby the future of the world.

Synthetic rubber, its production, compounding and application to war and industrial uses, is too big a story to present adequately here. There are five basic commercial types of synthetic rubber. Each of them has distinct properties and characteristics. Not a single one is ideal for all purposes.

Deciding which synthetic rubber to select and use for a particular task is an equally big story, a decision that requires expert knowledge and broad range experience.

We have told the story of the five basic commercial types of synthetic rubber, our more than twenty years of experience in working with them, and our twelve years of using synthetic rubber commercially in an interesting, informative booklet for business executives. Please ask for your copy on your regular business letterhead.

UNITED STATES RUBBER COMPANY

1230 SIXTH AVENUE, ROCKEFELLER CENTER, NEW YORK

In Canada: Dominion Rubber Co., Ltd.

May 13, 1943

FINANCIAL NEWS

New York Stock Exchange

High, Low and Last for Week Ending May 8, 1943

STOCKS

	High	Low	Last
A. P. W.	2⅞	2¾	2⅞
Armstrong Cork Co.	35½	34¾	34¾
Celotex Corp.	14⅜	13½	13⅜
Celotex Corp., pf.	91⅞	89	91⅞
Certain-Teed Products Corp.	7⅛	6⅞	6¾
Certain-Teed Products Corp., pf.	61½	58½	60½
Champion Paper & Fibre Co.	20⅜	19½	19¾
Champion Paper & Fibre Co., pf.	106¾	106	106¾
Congoleum Nairn Co.	24	21	23¼
Container Corp. of America	23	22¼	22½
Continental-Diamond Fibre Co.	14⅛	13⅜	13⅞
Crown-Zellerbach Co.	14⅛	13⅜	14¼
Crown-Zellerbach Co., pf.	92½	90½	92½
Dixie Cup Co.	13⅝	13¼	13½
Dixie Cup Co.—A	40½	40	40½
Flintkote Co.	19⅛	18⅛	18⅝
Flintkote Co., pf.	105½	105	105
Robert Gair	3⅜	3⅜	3⅜
Robert Gair, pf.	13½	13	13½
International Paper Co.	13⅜	12	12½
International Paper Co., pf.	60½	58½	59¼
Johns-Manville Corp.	85⅜	83¼	84½
Johns-Manville Corp., pf.	129½	129	129½
Kimberly-Clark Corp.	31½	30¼	30¼
MacAndrews & Forbes	29	27⅞	28
MacAndrews & Forbes, pf.	....	....	....
Masonite Corp.	34¾	32	34
Mead Corp.	9¾	9	9
Mead Corp., pf. A—6%	81	80	80
Mead Corp., pf. B—5½%	70	70	70
Paraffine Companies, Inc.	42½	42	42½
Paraffine Companies, Inc., pf.	100¼	100¼	100¼
Rayonier, Inc.	14	13⅛	13⅜
Rayonier, Inc., pf.	29⅜	29	29
Ruberoid Co.	23⅞	22¾	22¾
Scott Paper Co.	42¾	42	42¾
Scott Paper Co., pf.	111¼	111	111¼
Sutherland Paper Co.	30½	29	30
Union Bag & Paper Corp.	10⅛	10	10⅛
United Paperboard Co.	5⅜	5¼	5¼
U. S. Gypsum Co.	69¾	68	69¾
U. S. Gypsum Co., pf.	180	179½	180
West Virginia Pulp & Paper Co.	16	15¼	15¾
West Virginia Pulp & Paper Co., pf.	107½	107	107

BONDS

Abitibi Pulp & Paper Co. 5s '53	66	66	66
Celotex Corp. 4½s '47	102	101½	102
Certain-Teed Products Corp. 5½s '48	99½	99	99½
Champion Paper & Fibre Co. 4¾s '50	....	....	....
International Paper Co. 6s '55	107⅜	106¾	107⅜
International Paper Co. 5s '47	103⅛	102½	103
Mead Corp. 3¼s '53	....	....	....
West Virginia Pulp & Paper Co. 3s '54	....	....	....

New York Curb Exchange

High, Low and Last for Week Ending May 8, 1943

STOCKS

	High	Low	Last
American Box Board Co.	7½	6⅝	7½
Brown Co., pf.	....	....	....
Great Northern Paper Co.	33	32	32
Hummel-Ross Fibre Corp.	5	4⅜	5
National Container Corp.	12½	10¾	12
St. Regis Paper Co.	4¼	2¾	4
St. Regis Paper Co., pf.	132	129	131
Taggart Corp.	5	3⅞	4¼

BONDS

American Writing Paper Co. 6s '61	....	....	....

Abitibi Bonds are Firm

[FROM OUR REGULAR CORRESPONDENT]

TORONTO, Ont., May 10, 1943—There was a fair turnover during the last week or ten days in paper bonds, which showed firmness. Abitibi's at 70 were among the leaders in anticipation of another payment, plus reports that the Privy Council will soon hear the appeal on this company's re-organization proceedings. Financial Counsel reports that it understands that application will be made to the court shortly to approve a further payment to Abitibi bondholders. Details are now being worked out as to the amount and the form of distribution. Browns at 94¼ continued buoyant on the strength of the annual statement. Minnesota and Ontario Paper quarterly report was not particularly bright and showed bond interest for the period covered 5.9 times as compared with 11.7 times in the same period of last year. M. & O. statement backed up the Brown Co. report that current operations are resulting in profits well below those of last year.

Lily-Tulip Cup Nets $4.56

The Lily-Tulip Cup Corporation and subsidiaries for the twelve months to March 31, reports estimated net profit, before deducting $100,000 for future contingencies, was $698,301, equal to $3.68 a common share, compared with $865,405, or $4.56 a share, for twelve months to March 31, 1942. Provision for Federal normal income tax and surtax for twelve months was $307,141 and excess profits tax, after post-war cerdit, was $1,197,659, compared with $445,884 Federal normal tax and $768,673 excess profits tax for previous twelve months.

Newark Paraffine 40 Years Old

Newark Paraffine and Parchment Paper Company of 50 Jelliff avenue, Newark, N. J., this year is celebrating its 40th anniversary. Founded in 1903 by Moritz Eisner, the business is carried on by William J. Eisner, president, and Stanley J. Eisner, secretary and treasurer.

The company operates a papermaking mill at Pittston, Pa., and carries on waxing, printing and finishing operations at the Newark plant.

Continental-Diamond Profits Up

The Continental-Diamond Fibre Company and wholly owned domestic subsidiaries for the March quarter reports net income, after $642,000 provision for Federal taxes on income, less $55,000 post-war refund, and $25,000 provision for contingenies was $165,669, compared with $106,912 net income for period last year when $376.000 was deducted for taxes and $25,000 was provided for contingencies.

Great Lakes to Pay Dividends

The Great Lakes Paper Company is paying dividends of 25 cents a share on its classes A and B preference shares on July 2, 1943, to shareholders of record June 2. Following this payment, arrears will rise to $9.75 a share from $9.50 a share following the similar payment made April 2 this year.

Hammermill Earns $2.45

The Hammermill Paper Company and subsidiaries for 1942 reports net profit, after $1,105,000 Federal and State income and Federal excess profits taxes, was $551,389, equal to $2.45 a common share. This compares with $671,401, or $3.11 a common share, in 1941.

ONE OF A SERIES OF SUGGESTIONS TO AID PRODUCTION

HOW TO SOLVE

Operating Problems with *Correct Lubrication*

This strip of felt is oiled by hand. It is then covered with another strip to protect it from excessive water. The oil it imparts to the bearing must resist the washing effect of water.

Stop Wire Vibration and Wear

PROBLEM: If table rolls turn sluggishly they cause friction and wear of the wire. If they stop turning, a flat spot may frequently develop before the roll can be dropped.

If worn rolls are put back into operation they cause undesirable vibration of the wire. This vibration can result in irregularities in the formation of the sheet.

ANSWER: *Gargoyle Voco Engine Oil No. 1* is ideal for use on open bearings on the wet end of the paper machine. This oil possesses the film strength to resist wear. It is also designed to resist the washing effect of water found on this part of the machine. For grease-lubricated plain and anti-friction bearings, consult your Socony-Vacuum man for correct lubrication.

GARGOYLE Lubricants

SOCONY-VACUUM OIL COMPANY, INC. — Standard Oil of N. Y. Div. • White Star Div. • Lubrite Div. • Chicago Div. White Eagle Div. • Wadhams Div. • Magnolia Petroleum Company • General Petroleum Corporation of California

CALL IN SOCONY-VACUUM

DEPENDABLE CHEMICALS

CONSERVE MANPOWER

Trouble-free processing is a great aid in preventing spoilage, delays and loss of efficiency. Trouble-free processing is promoted by dependable chemicals, such as these HOOKER products for the paper industry:

HOOKER

Bleaching Powder — Caustic Soda — Chlorinated Paraffin — Chlorine — Muriatic Acid — Sodium Sulfide

In spite of war-created demands for unprecedented quantities of HOOKER chemicals, the rigid laboratory control which guards their quality is never relaxed. HOOKER quality is maintained in war as in peace.

HOOKER ELECTROCHEMICAL COMPANY
NIAGARA FALLS, N. Y.

New York, N. Y. Tacoma, Wash.
Wilmington, Calif.

HOOKER CHEMICALS

3698

ASKS FOR MORE PAPER

(Continued from page 13)

from 35 per cent to 60 per cent of unbleached chemical wood pulp has been made in lots 55-60, 71-73, 101-103, and 183-184. The increase in lot 48 is from 10 per cent to 50 per cent unbleached pulp. Ten per cent ground wood pulp is permitted in lot No. 41. The supply of rope fibers has become so limited that the War Production Board has refused to permit the use of these fibers for paper making in all but a few special exceptions. The specifications for lot Nos. 213 and 280 now call for "hemp and/or jute."

"Grain to run lengthwise of the sheet" was inserted in lots 19, 20, and 21.

Lots No. 48, 51, and 52 have been renumbered 47, 48, and 49. Lots 55-62 and 105-112 have been changed to 55-60 and 105-111 so that the lot numbers are consecutive.

All rag papers specifying less than 100 per cent rag pulp in which an ash content is specified now permit 5 per cent ash. 2 per cent was specified the last term.

Fifty per cent Rag Laid Cover, Wood Manila, Chemical Wood Manila, Jute Tag, and Manila Board formerly delivered in bundles, as well as Railroad Board formerly delivered in cases, are now to be delivered on skids.

Lot No. 36 has been added to include the purchase of 100 pounds Supercalendered Book Paper in rolls.

Lots 39 and 40 for Machine Coated paper in rolls have been dropped from the schedule.

Four new lots 50-53 Ground Wood Writing Paper, White and Colored, have been added to the schedule. These lots are added to assist in the pulp conservation.

A new lot, 50 per cent Rag Chart Paper, has been substituted for lot No. 68. The demand for this grade of chart paper has almost replaced that for 100 per cent Rag Chart Paper. Lot 70 has been eliminated and all the 100 per cent Rag Chart Paper has been consolidated under lot No. 69.

Two new items of Chemical Wood White Ledger have been added to cover the demand for 48 pound ledger. The new lots are lot 151 and 153. The former lot 151 has been given number 152.

This schedule embraces 139 lots, which is 2 more than the preceding schedule. The quantity estimated for the term of 3 months beginning July 1, 1943, is approximately 78,450,000 pounds, as compared with 115,545,000 pounds for the previous 6 months.

Starts New Paper Salvage Drive

[FROM OUR REGULAR CORRESPONDENT]

PHILADELPHIA, Pa., May 10, 1943—Boys and girls of all Philadelphia schools are joining in a new salvage drive to collect materials needed to make millions of water-proof containers for shipping munitions, food, medical supplies, clothing and lend-lease materials to all parts of the world.

Warner F. Haldeman, chairman of the Salvage Committee of the Philadelphia Council of Defense, explained that the scrap, consisting of brown wrapping paper, heavy brown paper bags, kraft paper and heavy cardboard, will be taken to public, private and parochial schools by trucks of the Salvation Army, Goodwill Industries, Volunteers of America, Sunday Breakfast Association, and St. Vincent de Paul Society.

All persons are urged to see that materials required are contributed to the school collections or sold to junk dealers.

COLOR MAKES THESE BANK FORMS TALK

THESE record forms serve a bank's Central Information File better, quicker, more accurately—because of color.

In small office or huge warplant, color serves equally well. Color distinctions on record forms, orders, job tickets, tags and labels speed processing, production and shipping—minimize errors, provide quick, accurate identification.

Color helps employees step up their output—guides new workers to a quicker understanding of their jobs. But paper and the dyestuffs that make it "talk" should be selected carefully—made to work with utmost effect in their million and one jobs—applied with an eye toward conservation.

Today's new paper products and specialties create additional new color problems. To help you meet these changing conditions, Du Pont Dyestuffs technicians offer the knowledge gained from years of experience with dyes, paper, and proper application. They can help you unite paper and colors most effectively—most economically. E. I. du Pont de Nemours & Co. (Inc.), Organic Chemicals Department, Dyestuffs Division, Wilmington, Delaware.

DU PONT DYESTUFFS
REG. U.S. PAT. OFF.

DYESTUFFS

BETTER THINGS FOR BETTER LIVING . . . *THROUGH CHEMISTRY*

Detail of "O" seam, magnified about 7-3/4 times.

A Fourdrinier wire can be *only as good as it "seams"*. Precision workmanship, adequate equipment and a resolve to do a continuously better job have gone far to advance the technique of seaming wires. Lindsay puts forth every effort to devise a seam with drainage characteristics approaching those of woven cloth and yet not sacrifice strength or flexibility. We aim to make every seam sound, uniform, unvarying in construction. Many a seam has in it 20,000 metal-to-metal joints which must be finished with almost incredible accuracy . . . Will the achievement of tomorrow be as undreamed-of as today's reality was a decade ago?

THE LINDSAY WIRE WEAVING COMPANY

Serving the Paper Industry Since 1903

14001-14299 ASPINWALL AVE. • CLEVELAND, OHIO

Lindsay **WIRES**

FOR PAPER MILLS

Rules on Processing Waste Paper

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., May 12, 1943—The Office of Price Administration ruled today that payment of charges for processing waste paper may not be so high as to raise the cost of such waste paper above maximum prices.

This was brought out in Amendment No. 2 to Maximum Price Regulation No. 30 (Waste paper), effective May 15, 1943.

Before the advent of price control, waste paper was purchased by consumers outright in deliverable condition. Such paper rarely was bought by consumers with the intention of having it processed by others to their individual specifications. Recently, however, a few consumers and dealers have requested permission to enter into arrangements whereby the consumer is to purchase waste paper which is thereafter to be resorted or otherwise processed for his account, either by the person from whom he made the purchase or by other persons.

In each such case, the purchase price plus the processing charge would exceed the maximum price permissible under the maximum price regulation upon an outright sale of the waste paper in its resorted and re-packed condition. Today's amendment to the regulation expressly prohibits payment of any processing charge which causes the total cost to purchaser to exceed the regulation's stipulated ceiling for an outright sale of the paper.

OPA recognized that when a tight market makes the highest quality of certain grades of waste paper difficult to obtain, a few consumers might be able to obtain more satisfactory supplies by means of processing arrangements. Any authorization of arrangements under which the processing charge would raise the cost to consumers would, however, encourage widespread evasions and would interfere seriously with price control in this field. OPA therefore decided that, whatever benefit might accrue to a few consumers under unrestricted processing operations would be heavily outweighed by the resulting harm to other consumers and to the entire waste paper industry.

Representative members of the waste paper industry consulted by OPA are in virtually unanimous accord with OPA's conclusion in the matter.

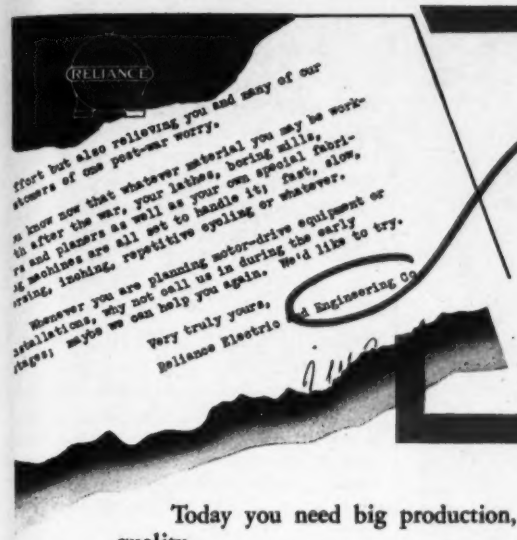
Would Make Paper Essential

WASHINGTON, D. C., May 10, 1943—A special subcommittee of the House Interstate Commerce Committee today drafted a recommendation to the War Production Board that immediate steps be taken to prevent "the waste and non-essential use" of paper by the government.

It also recommended that the War Manpower Commission put the paper producing industry on the list of essential war industries so that production may not be hampered by a manpower shortage.

The suggestion that paper production be declared an essential war industry was made by Representative Halleck of Indiana.

W. G. Chandler, WPB director of printing and publishing, testified that he understood that pending WMC orders did not recognize paper production as essential. Both Mr. Chandler and Arthur G. Wake-


RELIANCE
ffort but also relieving you and many of our
stomers of one post-war worry.
n know now that whatever material you may be work-
th after the war, your lathes, boring mills,
rs and planers as well as your own special fabri-
ng machines are all set to handle it; fast, slow,
rsing, inching, repetitive cycling or whatever.
Whenever you are planning motor-drive equipment or
stallations, why not call us in during the early
stages; maybe we can help you again. We'd like to try.
Very truly yours,
Reliance Electric d Engineering Co.

These two words make motor-drive more than power!

Today you need big production, high quality.

Tomorrow? The same requirements, probably; but with new methods and processes.

Fortunately, in your motor-driven equipment you can meet today's needs and, at the same time, be preparing for tomorrow's unknown demands. It takes good motors AND ENGINEERING.

Adapted to your needs, Reliance motor-drive can do *many things* for you.

If you design or use motor-driven machines or equipment, you need to get the right answer to this question: *"What can we make a motor do besides supply power?"*

Reliance Application Engineers—production-minded men with wide experience in providing flexible power and control through the use of motor-drive—can help you get the answer.

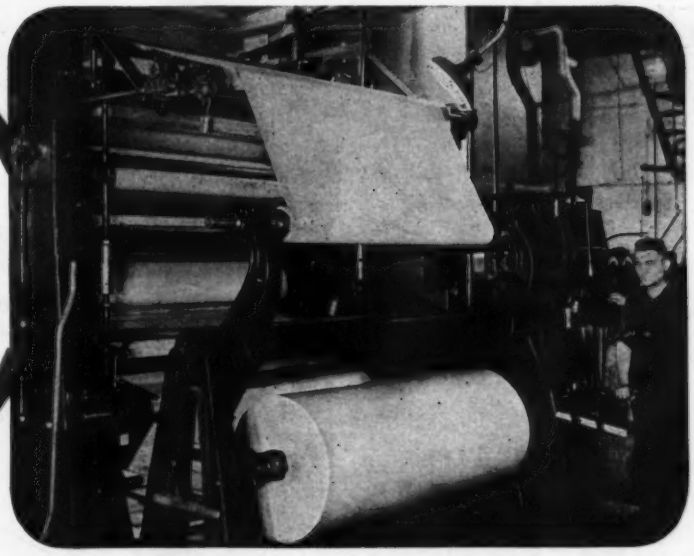
You will like the way they work. Just phone or write to our nearest office.

Motor-drive provides within itself a means of:

Speed Control	Reversing
Braking	Remote Control
Tandem Operation	Controlled Acceleration
Tension Control	Safety

Slow Speeds for inching, threading, inspection

Applying them to boost production and improve quality is APPLICATION ENGINEERING. That's our business.



Reliance Supercalender Drives provide the flexibility of power control so essential to maximum production of uniformly good quality paper: 120 (or more) operating speeds to suit material and operating conditions from threading through warm-up to a full calendering range; fast, but smooth, acceleration and deceleration save time and give protection to material and equipment on slow-downs for "flags" and stops for breaks; direct drive with centralized control means convenience, space-saving, fewer parts and lower maintenance.

RELIANCE ELECTRIC & ENGINEERING CO.

1088 Ivanhoe Road • Cleveland, Ohio

BIRMINGHAM • BOSTON • BUFFALO • CHICAGO
CINCINNATI • DETROIT • GREENVILLE, S. C.
HOUSTON, TEX. • LOS ANGELES • MINNEAPOLIS
NEW YORK • PHILADELPHIA • PITTSBURGH
PORTLAND, ORE. • ST. LOUIS • SAN FRANCISCO
SYRACUSE, N.Y. • AND OTHER PRINCIPAL CITIES

RELIANCE A-C D-C MOTORS

The Village Smithy stands no longer

"under the spreading chestnut tree." He pulls no wheezy bellows, he builds no carryalls. His counterpart presses buttons, manipulates ponderous machinery, works to gird America for war.

His job, your job, our job, has one main motive now — helping to win this war. All of us pulling together will win in the end. We may be obliged to inconvenience one another because Uncle Sam's work has the priority. But we will still do our utmost to serve our respective trades.

DRAPER BROTHERS COMPANY has survived three wars and will surely survive another. Meanwhile we will be tolerant with those who serve us and bespeak tolerance from those we serve. Deliveries may be delayed at times, but quality will never be sacrificed. You can still depend on **DRAPER FELTS.**

Draper Felts Favor Efficiency

DRAPER BROTHERS COMPANY

Woolen Manufacturers Since 1856

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Need for Post-War Plan Seen by W. L. Carter

MANCHESTER, N. H., May 10, 1943—Winthrop L. Carter of Nashua, president of the Nashua Gummed and Coated Paper Company, last week expressed the belief that in order to preserve democracy and guard against future mass sacrifice of lives of young people in war, the nation must have a postwar plan conceived under non-government auspices and supported and promoted by the people.

Speaking at the Carpenter hotel at a joint luncheon of the Rotary and Kiwanis clubs, Mr. Carter said that a plan carried out in this manner would "place a direct obligation on every one of us. If the plan is to have the universal support of the people, we—the people—must pledge our time, our thinking, and our money to its development."

He asserted that the people must pledge "our willingness to accept whatever self denial is necessary to its successful conclusion. This is the only way I see we can even in part repay our debt to the youth of this country. Let them never again be called on to offer their lives because of our failure to preserve and make workable the fundamental principles of liberty, freedom and democracy."

Mr. Carter, who is co-chairman of the state War Finance Committee and state chairman of the War Savings Staff, expressed the opinion that unless a workable plan for the future is submitted by non-government sources, the nation is sure to have a government plan.

He believes that, wholly aside from the merits of a government plan, there are dangers because it is a government plan which might invalidate all its usefulness.

"There is today a huge army of government employes whose political influence is tremendous. It doesn't require much imagination to fear that these bureaucrats would organize to see that the plan took care of them first, the soldiers second, and the general public last. A government plan would undoubtedly become a political issue and not an impartial economic one in the next presidential campaign.

"Finally, no government plan could be superimposed on the people without the strictest regimentation of our entire economy.

"I should think, after our recent experience in oil, food, gas and all the other rationing controls, we would realize that with the best inten-

tions in the world, it is simply impossible for the government to do an efficient job. That is why I stress the importance of the voluntary help of the people being absolutely essential to the successful performance of any plan.

"A government plan, rewarding some and penalizing others, is bound to fail. On the other hand, there is no limit to the sacrifice the people as individuals will cheerfully accept to further a plan of their own choosing.

"Those favoring a government plan would probably say I am arguing for a return to normalcy, such as was so disastrously attempted in the Harding administration. No intelligent person can desire or even think there is any possibility of our returning to the conditions existing before the war.

"It is not a question of the old plan or the new—both under government direction—but rather that the new economy shall avoid the failures of the old which I believe can best be achieved by a plan conceived under non-government auspices and supported and promoted by the people."

Simplifies Prices

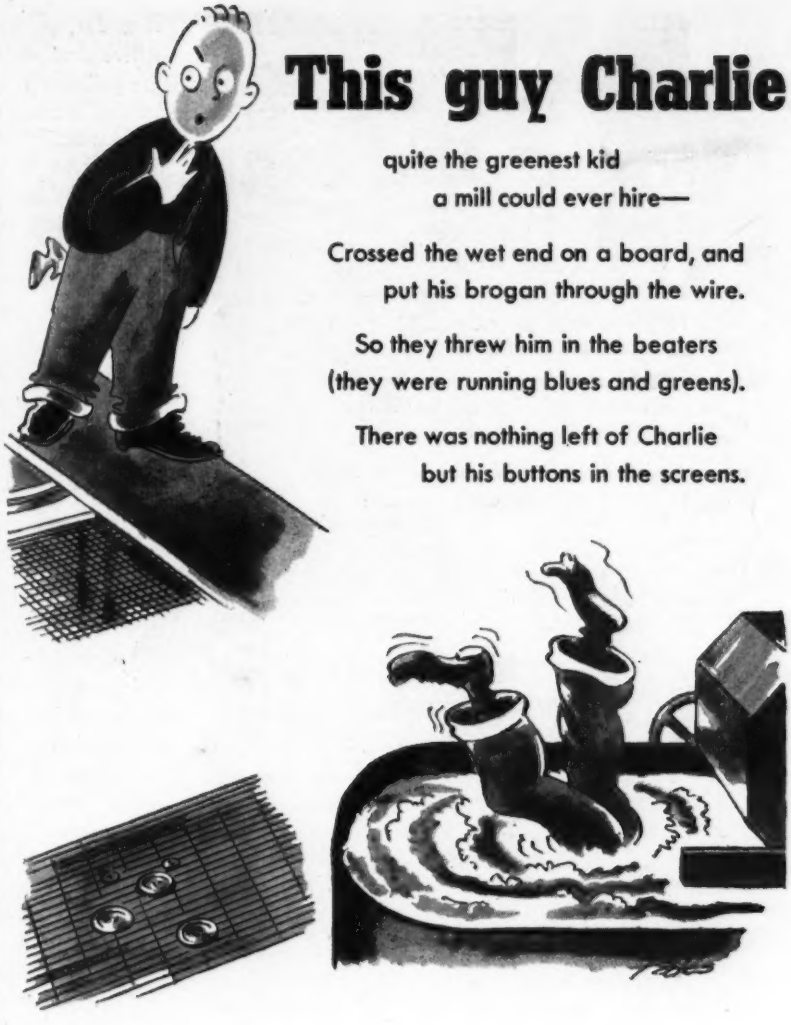
[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., May 12, 1943 —Determination of maximum prices by distributors of certain coarse paper products was simplified today by the Office of Price Administration.

These distributors are now permitted to add to the manufacturer's maximum price of goods shipped to them less-than-carload as well as carload freight charges before adding their dollars-and-cents mark-ups as listed in Maximum Price Regulation No. 349 (Distributors' Maximum Prices for Certain Coarse Paper Products). Distributors must still deduct all allowances for freight granted by the manufacturers, OPA pointed out.

Previously carload freight charges only could be added to the manufacturer's maximum price, and any differences for less-than-carload charges could only be added to the distributor's maximum price. This change will not affect resale prices generally, but will simplify computations for the distributor.

Amendment No. 1 to Maximum Price Regulation No. 349, effective May 21, 1943, also includes among the commodities covered newsprint used for wrapping and packaging purposes only, and changes the types of parchments from unprinted and printed to rolls and sheets for pricing purposes.



This guy Charlie

quite the greenest kid
a mill could ever hire—

Crossed the wet end on a board, and
put his brogan through the wire.

So they threw him in the beaters
(they were running blues and greens).

There was nothing left of Charlie
but his buttons in the screens.

We sympathize with you in your trouble with workers like Charlie. We can't protect you against them, but we *can* guarantee this: you can count on the *continued* high quality of Cheney Bigelow Wires, because we're keeping our highly skilled wire craftsmen on the job. Though an important percentage of our production now goes directly into vital military items, *we're also going right on with research and production of Fourdrinier wires and other mill equipment* . . . with full government approval; for paper, too, is a weapon.

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PAPER TRADE JOURNAL

Title Reg. U. S. Pat. Off.

Henry J. Berger
EDITOR

Vol. 116 May 13, 1943 No. 19

COMING EVENTS IN PAPER INDUSTRY

NEW ENGLAND SECTION. Technical Association of the Pulp and Paper Industry—Third Friday of each month at the Roger Smith Hotel, Holyoke, Mass.

DELAWARE VALLEY SECTION. Technical Association of the Pulp and Paper Industry—First Friday of each month at the Engineers Club, Philadelphia, Pa.

LAKE STATES SECTION. Technical Association of the Pulp and Paper Industry—Second Tuesday of each month at the Conway Hotel, Appleton, Wis.

KALAMAZOO VALLEY SECTION. Technical Association of the Pulp and Paper Industry—First Thursday of each month at the Park, American Hotel, Kalamazoo, Mich.

AMERICAN PULP AND PAPER MILL SUPERINTENDENTS ASSOCIATION, Twenty-fourth Annual Convention, Commodore Hotel, New York, June 15-17.

PRICE CONTROL

The "hold the line" order of the President is expected to have the effect of substantially increasing resistance to inflation and on a broader scale, or it must fall short of its objective, as all limited measures of price control have already failed. Price control in this country is in itself more complicated and on a larger scale, though there are points of similarity with price control measures adopted in other countries. Price control in the United States got off to an early but a too limited start. It failed to include industrial wages and agricultural prices and these two bulges have seriously interfered with the results so far. Now that the order to halt further inflation has been tardily issued, a more intensified effect is quite generally expected to follow. As the National Labor Relations Board is none too optimistic over the holding line on wages, some doubt has been expressed in various quarters that no more than partial success is likely to be accomplished with the present methods being utilized to keep prices well under control. A higher level of prices and a considerable upward adjustment of wages, now seems probable in the future.

The Government's struggle to restrain the advance in prices and the cost of living appears to have reached a critical stage, states the Guaranty Trust Company of New York in the current issue of *The Guaranty Survey*. "The outcome of the current wage and farm price issues may go far toward determining the success or failure of this country's part in the joint effort by which the United Nations hope to avoid severe price disturbance during and after the war," *The Survey* continues. "The elaborate mechanisms set up to achieve this purpose have functioned rather well thus far, particularly in Great Britain and Canada, where authorities apparently are less hampered by the political pressures that menace our own program. In this country also the present controls, fortified by the executive order of April 8, directing control authorities to restrict further price and wage increases to 'the minimum extent required by law,' seem capable of achieving their objective if they be protected against the attacks of those who fail to realize how vital stabilization is to success in the war effort and in the peace to follow."

In its analysis of three stabilization plans *The Survey* points out that "Numerous significant points of similarity and contrast appear in the methods by which the three closely related economies of Britain, Canada and the United States have sought to maintain price stability in the midst of the disturbing influences of wartime. Both the devices used and the degrees of success achieved have been determined partly by the particular types of economic stress that the war has imposed and partly by the broader features of the political and social backgrounds in the three countries. In general, the methods adopted seem to have met fairly well the requirements of these varying conditions, with the result that, while complete price stability has by no means been attained, the advance has been held within much narrower limits than it was during the last war despite the greater economic strains that have undoubtedly prevailed in the present instance. In all three countries, however, it is recognized that the potential causes of price disturbance will increase rather than diminish in power as time goes on and that progressive reinforcement and adaption of controls will be needed to avoid a repetition of the serious price disorders that accompanied and followed the first World War."

Declaring that continuing effort is required, *The Survey* goes on to say that "The results achieved indicated that success depends not so much on the exact nature of the regulatory mechanisms as on the firmness and judgment with which they are administered and the ability of leading economic groups to understand and accept the sacrifices that are indispensable to stability in wartime. If account is taken of the magnitude of the problems encountered, the more flexible and loose system adopted in Great Britain seems to have functioned no less effectively, and to have quite as favorable an outlook for continuing success, as the more rigid structures established in Canada and the United States. In all three countries, the controls have been sufficient to hold the price advance within comparatively moderate limits and have accomplished this objective without seriously interrupting the flow of essential goods and services. That this encouraging record can be maintained throughout the war period, however, is by no means assured. The pressure of expansive forces typical of wartime is constantly increasing and can be resisted only by cor-

responding increases in the counter-pressures exerted by control authorities."

In concluding its current analysis of price control *The Survey* states: "Another urgent need, especially in the United States, is a fiscal policy based on the recognition that direct price control is only one phase of an effective stabilization program. Although Federal taxes have risen sharply, they are still at a level representing only a small part of Government expenditures. The result is that a large volume of excess purchasing power continues to seek outlets and to exert a **steady and powerful upward** pressure on prices. Until this situation is corrected by adequate tax legislation, the outlook for the success of direct price control will remain very uncertain."

OPA Clarifies Kraft Paper Price

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., May 10, 1943—The recent $5 ton increase in price granted to manufacturers of Kraft Wrapping and Bag Papers does not apply to any grades of Kraft paper other than those specifically mentioned in Maximum Price Regulation No. 182, the OPA has announced.

This regulation covers definitely specified kraft wrapping papers and bag papers. All other kraft papers, including such converting grades as gumming kraft, envelope kraft, coin wraps, tire wraps, etc., have never been under Maximum Price Regulation No. 182 but are under Maximum Price Regulation No. 129, which freezes maximum prices as of October 1-15, 1941. Any increase in the prices of these kraft papers is a clear-cut violation of Maximum Price Regulation No. 129.

Production Ratio Report*

(Production as per cent of six-day capacity)

COMPARATIVE WEEKLY SUMMARIES

Current Weeks—1943		Corresponding Weeks—1942	
March 27	90.6	March 28	103.4
April 3	88.2	April 4	102.2
April 10	90.2	April 11	98.9
April 17	89.9	April 18	100.8
April 24	89.8	April 25	100.1
May 1	*85.7*	May 2	99.8

COMPARATIVE MONTHLY SUMMARIES

Year	Jan.	Feb.	Mar.	Apr.	May	June	July
1942	104.5	103.9	102.9	100.4	95.3	87.4	75.8
1943	87.5	88.9	89.6	*88.6*	....	....	....

Year	Aug.	Sept.	Oct.	Nov.	Dec.	Year Avg.
1942	80.8	82.8	90.6	86.9	80.1	90.4
1943	....	....	....	....	....	....

COMPARATIVE YEARLY SUMMARIES

	1936	1937	1938	1939	1940	1941	1942	1943
Year to Date	77.4	89.6	67.5	80.2	85.3	90.9	102.7	*88.6*
Year Average	80.4	79.8	71.5	83.4	85.6	97.4	90.4	...

* Based on tonnage reported to American Paper and Pulp Association. Does not include mills reporting to National Paperboard Association, except in isolated cases where both paper and paperboard are produced and separate tonnage figures are not readily available. Does not include mills producing newsprint exclusively.

PAPERBOARD OPERATING RATIOS†

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year Avg.
1937	83	89	89	91	88	80	69	77	72	70	57	47	75
1938	56	63	63	60	60	59	59	60	70	73	67	61	64
1939	65	73	76	74	69	73	68	77	82	91	88	77	77
1940	78	75	74	76	82	85	77	79	78	85	82	77	78
1941	81	88	89	89	91	94	92	98	95	99	98	90	92
1942	102	101	101	95	82	72	68	75	76	81	82	77	84
1943	86	88	94	*94*	..	..	..	..	..	..	..	..	..

Week ending Mar. 27, 1943—95 Week ending Apr. 17, 1943—96
Week ending Apr. 3, 1943—95 Week ending Apr. 24, 1943—97
Week ending Apr. 10, 1943—95 Week ending May 1, 1943—*89*

† Per cents of operation based on "Inch-Hours" reported to the National Paperboard Assn.

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TECHNICAL ASSOCIATION

OF THE PULP & PAPER INDUSTRY

Edited by R. G. Macdonald, Secretary

Use of Melamine Resins for Beater Wet Strength*

By Charles S. Maxwell[1]

Abstract

A new method of producing wet strength paper by the use of a melamine resin is described. The resin is prepared in such a manner that it is retained by the stock in the beater or at any other point of application in the papermaking operation prior to sheet formation. As a result of the unique properties of the resin complex, a high retention of the resin is secured and wet strength is imparted to the finished sheet. Particular points of advantage over regular tub application are a marked increase in dry strength, particularly noticeable in folding endurance, and superior permanence of the wet strength properties. The new process may be applied to all types of cellulose fiber, and in conjunction with any of the usual papermaking chemicals. It is noted that the refining of the stock has an important effect on the wet strength. Several commercial applications are cited.

The property of "wet strength" in paper has been known for some time. It has been common knowledge that several materials, such as glue-formaldehyde and regenerated cellulose (viscose) give a toughening effect to paper, even when the paper is completely water-saturated. In early practice it was customary to use tub applications of glue-formaldehyde to treat rosin-sized papers such as blueprint and writing grades, while the viscose processes were applicable to many grades of paper, either in tub or beater. However, the use of viscose was limited because of the toxicity of the fumes evolved, as well as the expense of removing the sulphur compounds.

The discovery that urea-formaldehyde resins[2] could be used for this purpose gave new impetus to the wet strength treatment of paper. Water-soluble urea-formaldehyde resins were found to impart excellent wet strength both to rosin-sized and waterleaf paper, when the paper web was impregnated with the resin solution and the resin subsequently cured on the paper machine driers.

Until very recently, this so-called tub application was the most satisfactory method of applying wet strength resins to paper. This limited the use of the resins to those mills which had size presses or some other means of surface application. A more general method of application was needed.

Problems of Beater Application

Innumerable efforts have been made to apply wet strength material to the paper stock *before* the paper is formed on the wire, and several patents have been issued on specific applications of this nature. However, none of these has been entirely satisfactory.

One big problem in connection with beater application[3] is that of retention. The concentration of fibers in paper stock before it reaches the wire is about 1%. If small amounts of resin are added to the fibers at this low concentration, the resin concentration will then be in the order of 0.01 to 0.05% resin in the water. This means that wet strength resins which are relatively insoluble, but still soluble to the extent of the above resin concentration, would be unsatisfactory because the resin would be dissolved and lost in the water of the papermaking process.

Unpolymerized urea-formaldehyde resins are water-soluble, and to render them insoluble for possible use in beater application, it is necessary to polymerize them. Several patented wet strength processes are based on this controlled polymerization. However, the fact that a resin has been rendered water-insoluble is not alone enough to make it a satisfactory wet strength resin. A highly polymerized, water-insoluble resin, dissolved in a solvent, emulsified, and then applied to fibers in a stock suspension, may give fair retention, but the wet strength may still be negligible. It is therefore reasoned that since retention is not the only necessary feature for a wet strength resin, distribution of the resin on the fiber must be an important factor. The problem, then, seems to be: *to obtain an essentially insoluble resin that will distribute itself uniformly on the paper fibers.*

Melamine-Formaldehyde Resins

Recently it has been found that melamine-aldehyde resins will impart wet strength properties to paper. Melamine resins are relatively new, but already they are providing, among other things, better finishes for automobile bodies and new plastics unsurpassed in electrical resistance. Their high durability and other

* Presented at the Annual Meeting of the Technical Association of the Pulp & Paper Industry, Hotel Commodore, New York, N. Y., Feb. 15-18, 1943.

[1] Member TAPPI; Paper Chemical Section, Stamford Research Laboratories, American Cyanamid Company, Stamford, Conn.

[2] The term "resin" is used loosely to include all urea-formaldehyde (or melamine-formaldehyde) condensation products from monomers to polymerized products.

[3] Beater application in this article is intended to include treatment of the stock, not only in the beater engine, but also at any point before the paper web is formed.

desirable properties more than compensate for their higher unit cost.

Melamine is basically a triazine consisting of a six-membered ring of alternate carbon and nitrogen atoms. Each carbon atom is also attached to an NH_2 group, and it is these groups that react with formaldehyde (Fig. 1).

Melamine resins, after treatment with acid under carefully controlled conditions have unexpected new properties which differ fundamentally from the urea resins. When this acid-treated resin is allowed to age, polymerization takes place and a blue haze develops, indicating the presence of resin particles in the colloidal range. One remarkable property of these colloidal particles is that they have a positive charge, as determined by cataphoretic methods. Cellulose fibers are considered to be negatively charged, so the addition of the positively charged, colloidal resin should result in a mutual attraction. Apparently this is exactly what happens.

When the resin colloid is mixed with paper stock, it almost immediately attaches itself to the fiber and forms such a close bond it cannot be washed free. Complete retention of the resin by the fiber is not achieved, but up to about 5% resin solids based on dry fiber, the retention plotted against the resin added is almost linear. However, above 5% a sharp break occurs, and practically no additional resin is held by the fibers, even though the amount of added resin is increased to 50% of the dry fiber weight (Fig. 2).

Physical Properties of Treated Paper

Cellulose fibers treated with 3% of this resin colloid retained between 60 and 80% of the added resin. The wet strength, as measured by the wet tensile strength after soaking 16 hours, increased from almost nothing to 50 or 60% of the original dry strength. Wet bursting strength increased in about the same proportion, while the wet rub resistance (double strokes to wear through the paper) rose from an average of ten, to several thousand. These effects should result from any satisfactory wet strength treatment. However, this specific beater treatment was found to give, in addition, unexpected valuable properties.

The dry burst and dry tensile values were increased about 15%. The folding endurance, instead of dropping, as is the case when wet strength is obtained by tub treatment, was materially increased, sometimes as much as several hundred per cent.

The aging properties of this beater-treated paper were also found to be remarkable. In working with

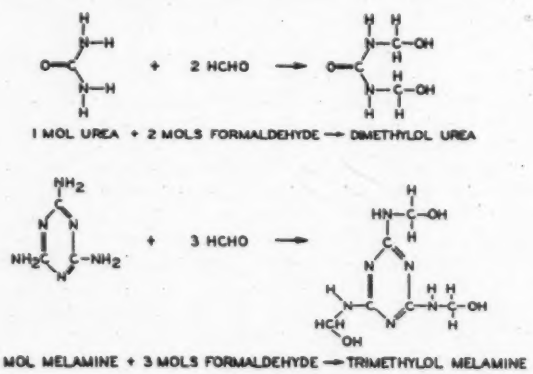

FIG. 1

Urea-Formaldehyde and Melamine-Formaldehyde Condensation Reactions

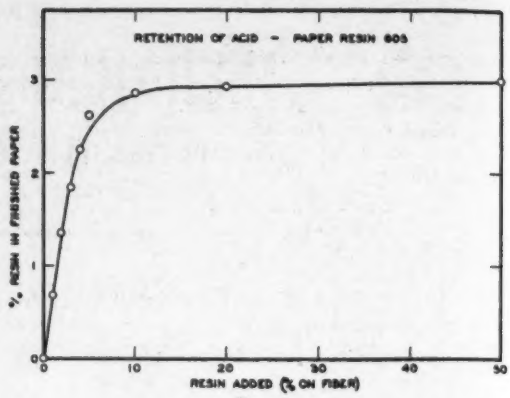

FIG. 2

Retention of Acid-Paper Resin 605

wet strength papers containing urea-formaldehyde, it had been noted that the wet strength effect decreased on aging, and that this drop was particularly rapid under storage conditions of high temperature and humidity. However, the melamine resin maintains its effectiveness even under these storage conditions (Fig. 3).

Under accelerated oven aging conditions[4] of 72 hours at 105°C., the beater-treated paper retains its folding characteristics remarkably well. As may be noted in Table I, the folding endurance of the beater-treated paper so aged is higher than that of the original untreated paper, and is much higher than the tub-

[4] Aging test used by U. S. National Bureau of Standards.

TABLE I.—OVEN-AGING TESTS *—105° C.

Type of Resin	Applied at	Wet Tensile ** Hours aged			Fold-Mit Hours aged			Tear-Elmendorf-g. Hours aged		
		0	16	72	0	16	72	0	16	72
(Blank)	.....	0.5	1.4	1.9	223	219	152	84	79	75
Urea-formaldehyde	Tub	10.3	10.8	11.2	189	120	40	45	47	34
Melamine-formaldehyde	Tub	4.6	11.9	11.4	191	89	41	64	48	38
Melamine-formaldehyde + HCl.....	Beater	8.1	9.3	9.0	1035	834	461	69	72	54

* All tests made on bleached kraft handsheets with approximate basis weight of 50 lb. (25 x 40—500).

** Wet tensile measured in machine direction on strips soaked 16 hours. Results expressed as pounds per inch.

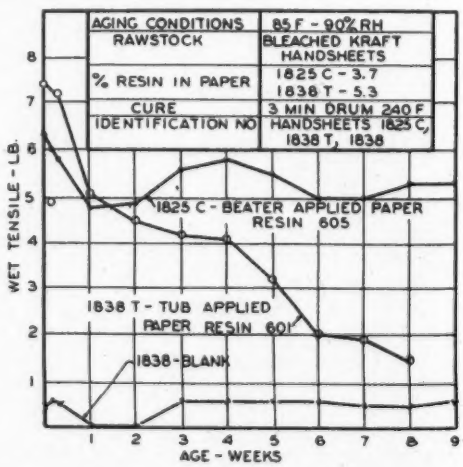

FIG. 3

Aging of Wet Strength Paper. Comparison Beater Applied Paper Resin 605 (Melamine-Formaldehyde) vs. Tub Applied Paper Resin 601 (Urea-Formaldehyde)

treated samples. This table also shows the tearing resistance of these same samples at various aging conditions. The tearing resistance is lowered by all wet strength treatments, but the beater-treated paper shows less lowering of tear values than either tub treatment.

The operating advantages of this "beater" wet strength melamine resin compared to a tub application of urea resin are obvious. No size press or other special equipment is required, the resin cures more rapidly due to the preliminary polymerization obtained by the acid treatment, and practically no formaldehyde fumes are evolved from the paper during the drying operation.

Preparing the Resin

The melamine resin (Paper Resin 605) as received by the mill is a finely pulverized white powder. The general procedure is to dissolve the dry resin in a mixture of warm water and hydrochloric acid, and then dilute with cold water to 12% resin solids. This makes one gallon of solution equivalent to one pound of dry resin.

This solution is allowed to age for at least 12 hours, after which time it is ready to be used. In this condition, the solution will normally keep several days, but if kept too long will gel and become unfit for use.

The most satisfactory point of application for the resin solution is after all beating and other refining have been completed, and a point often selected for this addition is at the fan pump. The treated paper coming off the machine will have appreciable wet strength, and this will normally improve after aging a few days.

Effects on Paper and Machinery

At this point it may be asked: is there any danger to the paper itself or to paper mill equipment in using this resin colloid? The use in the paper mill of a strong, volatile acid such as hydrochloric might be considered harmful. Indeed, in laboratory tests where this acid-resin solution was used as a tub application, the resultant paper was extremely brittle and discolored. However, paper formed from slush stock to which had been added the same quantity of this solution has high wet strength, extremely high folding endurance, and good "permanence." The explanation is that the acid does not go with the paper, but remains with the white water. This has been definitely checked by chemical analysis and by radioactive tracer methods.

Then the question may still be asked: does this acid do any harm in the white water or stock systems? Preliminary laboratory tests indicate that under the prevailing conditions, pH is the significant factor in corrosion, irrespective of what acids are present. These tests were performed by immersing bronze paper machine wire in two white water samples adjusted to a pH of 4.5. One of the white water samples was from stock treated with 5% acid resin colloid plus alum while the other contained alum only. The white water containing the acid resin was no more corrosive than the one containing alum alone.

A little simple arithmetic demonstrates why the acid can have only a slight effect on the pH of the stock. When 3% resin (on fiber) is used, which is sufficient for most purposes, the concentration of hydrochloric acid is about 0.5% on the fiber. With the fiber at about 1% consistency, the actual acid concentration would be about 0.005%. The natural salts in the water and stock neutralize most of this acid, but usually some drop in pH does occur. The actual drop depends on the buffering capacity of the paper mill water and has varied from no noticeable drop to 0.7 of a pH unit. In any case, if the lower pH is objectionable, the stock may be adjusted to any desired value, either before or after the addition of the acid resin, with no effect on the resin retention. However, the rate of cure of the resin will be affected by the pH. This melamine resin, as well as urea-aldehyde resins, cures faster at low pH values. Excellent cures are obtained in the normal papermaking pH range of pH 4.5 to 6.0.

Use with Other Chemicals

As far as is known, any of the usual papermaking sizing materials and fillers may be used with this treatment. No deleterious effects have been found, and in fact some combinations may give additional beneficial effects. Some of the materials used with the beater resin thus far have been rosin size, wax size, alum, starch, glue, and clay and other fillers. When both rosin size and the acid resin are used in a stock, a definite increase in water resistance results. If no size is used, the presence of the beater resin does not affect the water penetration, although slightly less water may be absorbed.

Some interesting results have been noted in laboratory experiments in which various types of dyes were incorporated with the resin-treated stock. It was found that with some dyes changes in shade, strength, and fastness properties occur. For example, the fastness to bleeding of many dyes in hot or cold water was definitely improved. In some instances, however, decreased fastness to light was observed, and apparently the decrease in light fastness was proportional to the amount of resin present. Obviously these implications will be of great interest to manufacturers of many grades of paper. An extended investigation is in progress, results of which will be made available as soon as possible.[5]

Importance of Refining Treatment

The question may arise as to what type of fiber is best suited for wet strength purposes. Based on considerable laboratory investigation and a number of mill trials, it has been concluded that the beater resin treatment is equally effective on any form of cellulose fiber, although the results are naturally more noticeable when used with a strong pulp. For example, a wet strength kraft sheet may have a dry tensile strength of 20 pounds and a wet tensile of perhaps 10 pounds. A groundwood sheet given similar treatment, having a dry tensile of 2 pounds, would be expected to have a wet tensile of 1 pound.

The effect of refining the stock is peculiar. It was mentioned above that the best point to add the resin solution to the stock is after the stock has been fully refined. Two batches of pulp were beaten and refined similarly in laboratory equipment, except that in one case the resin was added to the stock at the beginning of the beating cycle and samples taken at intervals. In the other case, no resin was added to the pulp before beating, but was added to separate samples taken throughout the beating and refining cycles. The results are shown in Table II.

[5] Most of the work on dyes is being carried out by the Heller & Merz Department, Calco Chemical Division of the American Cyanamid Company at Bound Brook, N. J.

TABLE II.—EFFECT OF ADDING RESIN BEFORE OF AFTER REFINING*

Length of Beater Treatment (Full Load) Min.	Length of Morden Refining, Min.	No Resin Added		Resin Added Before Morden			Resin Added After Morden		
		Fold, MIT	Wet Tensile **	Resin, %	Fold, MIT	Wet Tensile **	Resin, %	Fold, MIT	Wet Tensile **
15	0	2	1.0	1.5	24	2.7	1.4	18	2.9
15	0	28	2.0	1.7	264	5.1	1.5	522	7.0
15	2	114	2.4	2.2	1074	7.8	2.0	1148	10.2
15	5	576	2.9	2.4	1177	7.6	2.1	1141	11.7
15	15	1537	2.7	2.4	1517	6.6	2.3	2160	15.8
15	30	1762	2.5	2.3	3181	5.3	2.4	3233	14.4

* All tests made on bleached kraft handsheets with approximate basis weight of 50 lb. (25 x 40—500).

** Wet tensile measured in machine direction on strips soaked 16 hours. Results expressed as pounds per inch.

It should be noted that the resin retention is practically the same in the two series, but the efficiency of the treatment is over a hundred per cent better in the sheets made from stock that was first refined, then resin-treated.

Applications

The possible uses of wet strength paper are almost infinite, particularly when dry strength and fold endurance are also increased, as they are when the beater method is used. First and foremost are the wartime demands for products such as camouflage strips and netting, paper bags that must substitute for burlap and shipping containers that will not fall apart when saturated with water.

Other applications for the beater resin range from the production of blueprint stock and strong papers for wrapping vegetables and meat, to towel stocks consisting mainly of groundwood. The additional dry strength obtained permits the use of lighter weight paper in many instances, thus releasing pulp for other uses, and partially offseting the cost of the wet strength treatment.

Commercial applications of the new beater wet strength process have developed so rapidly that the fundamental investigation of the mechanism involved is still in progress. As the work continues, it is expected that additional basic data will lead to an even wider scope of commercial usage, possibly even in fields other than papermaking.

Acknowledgment

The work reported in this paper is the result of the cooperative efforts of many individuals, and the author wishes to acknowledge the valuable assistance of several groups at the American Cyanamid Company's Stamford Research Laboratories and at the laboratories of the Calco Chemical Division at Bound Brook, N. J.

Delaware Valley TAPPI Elects Officers

The Delaware Valley Section of the Technical Association of the Pulp and Paper Industry held its regular monthly meeting at the Engineers Club, Philadelphia, Pa., May 4, 1943, with chairman John Davis, presiding.

The result of the letter ballot for Section officers was presented as follows: Chairman—Wm. M. Shoemaker, 1st Vice Chairman—A. M. L. Bixler, 2nd Vice Chairman—Walter Quinn, Secretary and Treasurer—Lois V. Hans, Executive Committee—E. N. Poor, John Davis, E. J. Albert, Forrest Brainerd, and C. M. Connor.

Chairman Davis introduced Alfred R. Bechtel of the Thwing-Albert Instrument Company who discussed the formation characteristic of paper and the formation tester. The formation testing instrument was demonstrated by Mr. Bechtel and George A. Suydam of the Riegel Paper Corporation.

TAPPI EDITORS' NOTE: Mr. Bechtel cited several reports on formation testing and the testing instrument, *see Technical Association Papers* 18:386-391 (1935); PAPER TRADE JOURNAL (Dec. 31, 1936); PAPER TRADE JOURNAL (Jan. 7, 1937).

After the discussion and demonstration of the formation tester, Chairman Davis turned the meeting over to the new chairman, Wm. M. Shoemaker, who appointed the Program Committee consisting of: Jacob Edge, chairman, Riley Bates, Forrest Brainerd, Carl Schmidt, Ed Street, and C. M. Connor; and the Membership Committee consisting of: George B. Martin, chairman, Paul Baldwin, L. K. Burnett, Harry Hulmes, and Louise E. McGrath.

Among those present were:

Edward J. Albert, A. H. Anderson, Paul C. Baldwin, H. L. Becher, A. R. Bechtel, Dorothy Beiswinger, A. L. M. Bixler, Alan R. Boyd, Forrest Brainerd, J. S. Brown, L. K. Burnett, J. M. Chesnutt, C. M. Connor, A. M. Cooper, J. D. Davis, Walter Dempsey, D. Dieffenderfer, J. C. Dieffenderfer, Paul Easton, H. J. Farns, E. N. Glauner, Phil Goldsmith, Jess Good, Alan H. Griffin, A. E. Griffin, Lois Hans, H. F. Hoffmann, Harry Hulmes, V. Jacobsen, George J. Lane, Ethel Liethold, J. P. Lippincott, Ruth R. McConky, Louise E. McGrath, Alex. McInnes, Wm. D. Marshall, G. B. Martin, H. C. Merritt, Lewis B. Miller, Edward Molzon, B. Perris, E. N. Poor, Lt. R. J. Proctor USNR, Bill Putney, Homer F. Ray, Walter F. Reynolds, C. H. Rice, C. W. Rivise, John Roslund, J. Carl Schmidt, Chas. A. Shubert, George Spencer, D. Manson Sutherland, Geo. M. Suydam, Roy Underdown, A. E. Wangle, Vincent F. Waters, and J. Woller.

TAPPI Notes

H. M. Gray, formerly Washington, D. C., representative of the A.P.P.A. is now paper mill manager for the Sealright Co., Inc., Fulton, N. Y.

Lieut. Col. W. A. Kelley is now located at the Signal Corps Depot, Lexington, Ky.

Harry A. Cunningham, formerly of the Gardner-Richardson Company is now Tech. 5th with the Medical Detachment, Fort Thomas, Ky.

D. W. Ambridge, formerly assistant general manager for the Ontario Paper Co., Thorold, Ont., is now director-general of the shipbuilding branch of the Dominion Dept. of Munitions and Supplies.

John G. Strange has resigned as chief of the War Products Development Section, Pulp and Paper Branch, WPB, and will return to the Institute of Paper Chemistry as Secretary.

R. J. Zaumeyer of the Kimberly-Clark Corporation will replace Mr. Strange at the WPB.

R. C. Spencer of the Lowe Paper Company has replaced Herman Whitmore as Deputy Chief of the Section. Mr. Whitmore has returned to the Robert Gair Co. W. H. Swanson of the Kimberly-Clark Corporation has completed a month of temporary service with the WPB and has returned to Neenah, Wis.

The Technical Section of the Canadian Pulp and Paper Association will meet at the Seigniory Club, Montebello, P. Q., June 10-12, 1943.

Paper Mill Operating Experiences with Accelator Softeners and Clarifiers*

By A. C. Embshoff[1]

Abstract

Adaptability of the Accelator to various water treatment requirements is discussed, and operating data on serveral mill installations are presented to indicate the versatility of treating equipment of this type.

While water, because of the enormous quantities used in the production of pulp, paper, and paper board, has always been one of the industry's most important raw materials, it is only within the past decade that the industry has really become "water conscious." The reasons for this are many.

Most of the earlier mills were built in northeastern, north central and northwestern United States where pulpwood was plentiful and waters, on the whole, fairly soft and relatively clean. However, as extensive areas were logged, and in many instances converted to farming, increased run-off from the watersheds has materially altered the characteristics of most of the streams.

Rapid industrialization and increased population in other areas have introduced contamination from industrial and domestic sources as an additional problem. The construction of the southern pulp mills in "hard water" districts has resulted in processing difficulties not previously encountered to any considerable degree.

These factors, together with the necessity or desirability for improved quality of product, or the making of new products, all combine to make the pulp, paper, and paperboard industry increasingly conscious of the important part water occupies in its activities. A great deal of credit for this "consciousness" must also be given to the authors of numerous papers which have been read before this association, and to the able chairman of the TAPPI Water Committee, Lewis B. Miller.

Coincidental with this growing need for process water of better quality has been the development of improved water treating equipment. Employing the customary water treating chemicals in a new way, the industry is afforded, in most instances, treatment results hitherto unobtainable; and in other instances, better water at less cost.

Outstanding among these developments in improved water treating equipment is the Accelator for softening, or clarification, or both. A number of papers have been read before this and other associations in which its principles of design and operation and, to some extent, its performance on certain applications have been discussed. It is the purpose of this paper to present factual information on the performance of a number of pulp and paper mill installations which have been in daily service from one to three years treating various types of waters.

Before presenting this factual data, however, I would like to refresh your memory on the operating principles of the Accelator—because the principles employed have such a direct and important bearing on the results obtained.

As an aid in visualizing these principles, Fig. 1 shows the mechanics of the apparatus.

Note the primary and secondary reaction chambers, the way in which water and chemicals enter and in which flows are directed.

The first distinctive principle of the process is that chemicals are added and chemical reactions take place in the primary reaction zone in the presence of previously formed sludge or slurry. Under these conditions, resulting precipitation takes place on the surface of the old particles and the resulting flocculent or granular product is almost immediately ready for separation. The formation of finely divided reaction products, formed when chemicals are added to the water before sludge contact, and the difficulties of securing coagulation and agglomeration are largely, if not entirely, eliminated.

From the primary reaction chamber the entering raw water and 4 to 5 volumes of recirculated slurry pass into secondary mixing and reaction zones where slow stirring and continued sludge contact bring the treatment reactions to equilibrium before discharge into the outer portion of the Accelator for solids separation. The degree to which reactions proceed to completion are exemplified by operating data which will be later presented.

Leaving the secondary reaction zone — or outer draft tube—the water-slurry mixture is discharged outward and downward — the whole slurry mixture being in rapid, directional motion from which a volume of treated water is displaced upwardly by an equal volume of incoming raw water — the remaining three or four volumes of circulating slurry returning to the primary mixing zone.

This feature of directed flow and dynamic separation of the treated water from a moving stream or current in a direction approximately at right angles to the main slurry flow is the second distinctive operating principle of the Accelator.

* Presented at the Annual Meeting of the Technical Association of the Pulp & Paper Industry, Hotel Commodore, New York, N. Y., Feb. 15-18, 1943.

[1] Manager, Industrial Division, Infilco, Inc., Chicago, Ill.

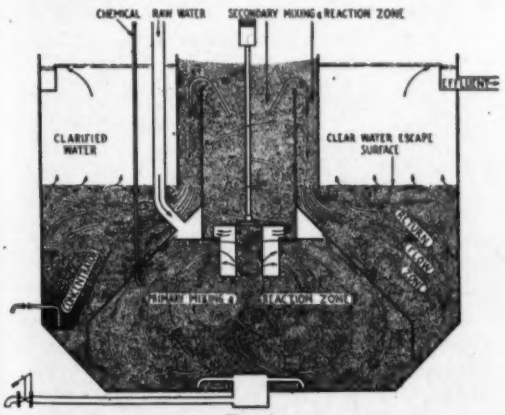

FIG. 1
Diagrammatic Cross Section

Separating the treated water in this manner takes advantage of the fact that solids in suspension in a fluid in motion do not readily change direction owing to their inertia. For example, if sand is being carried along with water in a pipe at considerable velocity, water discharged at low velocity from holes in the wall of the pipe will be relatively free from sand because the sand, due to inertia, tends to move in a straight line. The separation of the clarified, treated water from the circulating slurry in the Accelator may be likened to the separation of water from a water-sand mixture flowing through a pipe.

The circulating slurry has a velocity of 2 to 3 inches per second whereas the water which separates has a rising rate of only 0.06 to 0.08 inch per second. Thus, instead of utilizing only the force of gravity, which provides only a slight differential between the relative downward velocity or *settling rate* of the sludge particles and the upward velocity or *rising rate* of the clarified water, for separation, as in "sludge blanket" types of treating units, the Accelator employs the very considerable differential between relative velocity outward and downward of the sludge particles and the upward velocity of the rising water. Consequently, the problem of separation of clarified water from the circulating slurry is greatly simplified; and the reason why high rising rates are possible with the Accelator becomes apparent. The separated water does not have to rise through a sludge blanket. Therefore expansion of the sludge blanket, a limiting factor in other types of "upflow, rapid rate" softeners, is of no consequence in the Accelator.

Solids formed in excess of the concentrations desired in the circulating slurry, are removed by means of sludge concentrators, which are simply zones of quiescence in which the sludge may readily settle. Little or no sludge accumulates on the bottom of basin, due to the circulation rates employed.

With these basic principles of operation in mind, the exceptional performance of units of this type, as shown by the data which follows, becomes credible instead of virtually unbelievable.

FIG. 2

Case A

A clarifier installation (Fig. 2) in a converting plant, handling a highly contaminated river water of variable turbidity, comprising two 54-foot diameter units each having a rated capacity of 4200 g.p.m. and operated, on occasions, at rates up to 6000 g.p.m. Tables I-V give typical log sheets of the operation of these units.

Note from these log sheets, that despite the fact that the turbidity of the raw water varies rapidly from 130 to 1500 p.p.m.—in one case going from 290 p.p.m. to 1500 p.p.m. within four hours—and despite the fact that the rising rate varies between 2.0 and 2.5 g.p.m. per sq. ft. per minute depending on load conditions, the turbidity of the Accelator effluents never exceeds 3 p.p.m. and is usually 1 to 2 p.p.m. These remarkable results are obtained using aluminum sulphate only as the treatment reagent, the dosage ranging from 2 to 4 grains per gallon (0.3 to 0.6 lb. per 1000 gal.) with an average of probably 2.5 grains per gallon (0.36 lb. per 1000 gal.).

Note also the uniformity of the pH of the treated water. This uniformity of quality and pH of the water are highly important from the standpoint of standardization of mill operations since with water of such constant characteristics, at least one variable in mill operation is eliminated.

The log sheets presented herewith are typical of the

TABLE I.—FILTER PLANT TESTS—RAW WATER

	10 A.M.	Cl.	2 P.M.	Cl.	6 P.M.	Cl.	10 P.M.	Cl.	2 A.M.	Cl.	6 A.M.	Cl.
Turbidity	225		340		800		240		200		280	
pH	7.0		6.9+		6.8		6.9		6.9		6.9	
Total Alk.—M-Test	74		63		59		69		65	.6	60	
No. 1 Eff. pH	6.3+	.6	6.3	.5	6.3	.15	6.3+	.40	6.6		6.3	.4
No. 1 Eff. Turbidity	1		1		1		2		3		2	
No. 1 Eff. Total Alk.	46		42		33		39		53		36	
No. 2 Eff. pH	6.4	.45	6.3	.4	6.3	.05	6.3+	.3	6.5	.45	6.3	.2
No. 2 Eff. Turbidity	1		2		2		1		2		2	
No. 2 Eff. Total Alk.	46		40		34		38		45		36	
Hardness	156		280		290		290		230		310	
Alum Residual	...		...		...		...		...		...	
FILTERED WATER												
Alk.—M-Test	33		39		34		39		48		36	
pH	6.4		6.3		6.3		6.3+		6.5		6.3	
Soda Ash	...		...		...		...		...		...	
pH CORRECTED WATER												
pH	...		...		...		...		...		...	
Chlorine Residual	.40		.45		.05		.35		.5		0.25	
No. 1 Alum	2.50		2.54		2.60		2.24		2.43		2.57	
No. 2 Alum	2.48		2.53		2.60		2.60		2.43		2.57	
ACCELATOR OPERATION												
Sludge Tests												
Circ. Slurry % Vol. 5 Min.	10	14	10	12	15	17	10	12	12	13	11	14
Concentrator % Vol. 5 Min.	63	52	65	58	51	62	64	55	76	68	72	56
Timer Setting	40	35	40	35	70	70	40	40	40	40	40	40
No. 1 Lime	..	..	..	..	..	..	..	..	..	..	..	..
No. 2 Lime	..	..	..	..	..	..	..	..	..	..	..	..
CHEMICALS USED												
Alum	1000 lb.				1000 lb.				900 lb.			
Soda Ash	.....				.....				.....			
Gr. Alum Per Gal.	.....				.....				.....			
Operators		7-3				3-11				11-7		

TABLE II.—FILTER PLANT TESTS—RAW WATER

	10 A.M.	Cl.	2 P.M.	Cl.	6 P.M.	Cl.	10 P.M.	Cl.	2 A.M.	Cl.	6 A.M.	Cl.
Turbidity	290		1500		290		490		700		250	
pH	6.8		6.8		6.8		6.8		6.8		6.9	
Total Alk.—M-Test	69		57		64		71		58		64	
No. 1 Eff. pH	6.3	.75	6.2+	.3	6.5	.25	6.3+	.55	6.3	.2	6.3	.3
No. 1 Eff. Turbidity	2		2		2		1		2		2	
No. 1 Eff. Total Alk.	38		33		39		41		39		39	
No. 2 Eff. pH	6.2+	.5	6.3	.15	6.3	.05	6.3	.45	6.3	.02	6.3	.02
No. 2 Eff. Turbidity	2		2		2		2		2		2	
No. 2 Eff. Total Alk.	37		33		36		44		40		40	
Hardness	270		220		195		...		350		335	
Alum Residual	...		...		...		...		...		...	

FILTERED WATER

Alk.—M-Test	3.8		35		37		45		40		40	
pH	6.3		6.3		6.3		6.3		6.3		6.3	
Soda Ash	...		...		...		...		...		...	

pH CORRECTED WATER

pH	...		...		...		...		...		...	
Chlorine Residual	.40		.20		.05		.30		.1		.2	
No. 1 Alum	3.05		3.10		2.55		2.68		2.32		2.56	
No. 2 Alum	3.0		2.96		2.50		2.61		2.38		2.54	

ACCELATOR OPERATION

Sludge Tests												
Circ. Slurry % Vol. 5 Min.	13	13	18	19	Bolt on	16	8	10	13	15	14	15
Concentrator % Vol. 5 Min.	68	64	79	75	speed trol.	64	92	83	82	52	92	75
Timer Setting	40	40	60	60	broke	40	10	40	35	40	35	40
No. 1 Lime	..	..	..	..	..	..	..	..	..	..	..	..
No. 2 Lime	..	..	..	..	..	..	..	..	..	..	..	..

CHEMICALS USED

Alum	1400 lb.				1000 lb.				1100 lb.			
Soda Ash	.....				.....				.....			
Gr. Alum Per Gal.	.....				.....				.....			
Operators		7-3				3-11				11-7		

TABLE III.—FILTER PLANT TESTS—RAW WATER

	10 A.M.	Cl.	2 P.M.	Cl.	6 P.M.	Cl.	10 P.M.	Cl.	2 A.M.	Cl.	6 A.M.	Cl.
Turbidity	285		270		250		1200		230		198	
pH	7.0		6.9		6.8		6.8+		7.0		7.1	
Total Alk.—M-Test	58		63		69		60		63		71	
No. 1 Eff. pH	6.3	.1	6.3	.12	6.3+	.45	6.3+	.12	6.2	.15	6.3	.5
No. 1 Eff. Turbidity	2		2		2		2		2		2	
No. 1 Eff. Total Alk.	34		35		42		37		34		40	
No. 2 Eff. pH	6.3	0	6.2+	.05	6.3	.25	6.3+	.10	6.2	.1	6.3	.4
No. 2 Eff. Turbidity	1		2		2		2		2		2	
No. 2 Eff. Total Alk.	35		33		40		37		34		40	
Hardness	288		224		265		255		240		260	
Alum Residual	...		...		...		...		...		...	

FILTERED WATER

Alk.—M-Test	34		32		42		38		34		40	
pH	6.2+		6.3		6.4		6.4		6.2		6.3	
Soda Ash	...		...		...		...		...		...	

pH CORRECTED WATER

pH	...		...		...		...		...		...	
Chlorine Residual	.05		0		.20		.12		.1		.45	
No. 1 Alum	3.00		3.01		2.98		3.06		3.02		3.00	
No. 2 Alum	3.06		3.05		2.98		3.02		2.65–3.00		3.06	

ACCELATOR OPERATION

Sludge Tests												
Circ. Slurry % Vol. 5 Min.	15	15	15	14	13	12	17	17	15	14	11	11
Concentrator % Vol. 5 Min.	50	45	45	45	55	52	70	75	60	46	50	60
Timer Setting	55	50	55	50	50	45	40	35	60	60	60	40
No. 1 Lime	..	..	..	..	..	..	..	..	..	..	..	..
No. 2 Lime	..	..	..	..	..	..	..	..	..	..	..	..

CHEMICALS USED

Alum	1300 lb.				1200 lb.				1400 lb.			
Soda Ash	.....				.....				.....			
Gr. Alum Per Gal.	.....				.....				.....			
Operators		7-3				3-11				11-7		

TABLE IV.—FILTER PLANT TESTS—RAW WATER

	10 A.M.	Cl.	2 P.M.	Cl.	6 P.M.	Cl.	10 P.M.	Cl.	2 A.M.	Cl.	6 A.M.	Cl.
Turbidity	190		900		800		250		130		600	
pH	6.9		6.9		6.9		6.9		7.1		7.1	
Total Alk.—M-Test	58		61		67		60		71		68	
No. 1 Eff. pH	6.3	.25	6.5	.75	6.5+	0	6.3+	0	6.3	.6	6.5	.45
No. 1 Eff. Turbidity	1		1		3		2		2		2	
No. 1 Eff. Total Alk.	35		47		46		34		45		49	
No. 2 Eff. pH	6.3	.02	6.5	.75	6.5	0	6.3+	0	6.5	.5	6.5	.3
No. 2 Eff. Turbidity	2		2		3		2		2		2	
No. 2 Eff. Total Alk.	35		45		50		34		45		46	
Hardness	240		250		250		250		230		220	
Alum Residual	...		...		...		...		...		...	

FILTERED WATER

Alk.—M-Test	32		47		50		32		45		47	
pH	6.3		6.5		6.5		6.4		6.4		6.5	
Soda Ash	...		...		...		...		...		...	

pH CORRECTED WATER

pH	...		...		...		...		...		...	
Chlorine Residual	.15		.5		0		0		.05		.35	
No. 1 Alum	2.38		2.32		2.25		2.25–2.43		2.53–2.25		2.27	
No. 2 Alum	2.41		2.25		2.25		2.25–2.46		2.20		2.23	

ACCELATOR OPERATION

Sludge Tests												
Circ. Slurry % Vol. 5 Min.	11	11	10	9	18	19	15	16	12	12	13	13
Concentrator % Vol. 5 Min.	54	60	60	51	89	90	82	95	50	42	74	69
Timer Setting	40	35	40	35	40	35	40	35	50	50	40	35
No. 1 Lime	..	..	..	..	..	..	..	..	..	..	..	..
No. 2 Lime	..	..	..	..	..	..	..	..	..	..	..	..

CHEMICALS USED

Alum	900 lb.				1000 lb.				1000 lb.			
Soda Ash	.....				.....				.....			
Gr. Alum Per Gal.	.....				.....				.....			
Operators		7-3				3-11				11-7		

TABLE V.—FILTER PLANT TESTS—RAW WATER

	10 A.M.	Cl.	2 P.M.	Cl.	6 P.M.	Cl.	10 P.M.	Cl.	2 A.M.	Cl.	6 A.M.	Cl.
Turbidity	300		390		200		125		450		260	
pH	7.0		6.9		6.8		6.9		7.0		6.9	
Total Alk.—M-Test	61		58		58		64		66		60	
No. 1 Eff. pH	6.3	.05	6.5	.15	6.2+	.07	6.5	.15	6.3+	.3	6.4	.05
No. 1 Eff. Turbidity	2		2		2		2		1		2	
No. 1 Eff. Total Alk.	36		42		29		46		44		38	
No. 2 Eff. pH	6.3	0	6.5	.1	6.3	.05	6.4+	.13	6.4	.17	6.4+	.05
No. 2 Eff. Turbidity	2		2		2		2		2		2	
No. 2 Eff. Total Alk.	37		41		29		41		46		32	
Hardness	240		195		250		250		240		150	
Alum Residual	...		...		...		...		...		...	
FILTERED WATER												
Alk.—M-Test	35		43		28		40		49		34	
pH	6.3		6.5		6.3		6.4+		6.4		6.4	
Soda Ash	...		...		...		...		...		...	
pH CORRECTED WATER												
pH	...		...		...		...		...		...	
Chlorine Residual	0		.1		.05		.05		.15		0	
No. 1 Alum	2.12		2.22		2.28		2.13		2.50–2.25		2.24	
No. 2 Alum	2.16		2.25		2.30		2.24		2.02–2.25		2.19	
Sludge Tests					**ACCELATOR OPERATION**							
Circ. Slurry % Vol. 5 Min.	9	8	9	10	15	15	11	10	12	13	10	10
Concentrator % Vol. 5 Min.	61	58	50	47	82	75	82	68	50	70	72	76
Timer Setting	40	35	40	55	40	35	40	35	40	35	40	35
No. 1 Lime	..	..	..	..	..	..	..	..	..	..	..	..
No. 2 Lime	..	..	..	..	..	..	..	..	..	..	..	..
CHEMICALS USED												
Alum	800 lb.				900 lb.				900 lb.			
Soda Ash	.....				.....				.....			
Gr. Alum Per Gal.	.....				.....				.....			
Operators		7-3				3-11				11-7		

results obtained from these units during the three years they have been in service.

Case B

A clarifier installation, in a converting plant, handling a river water normally of moderate turbidity but subject to sudden change, comprising two 52-foot diameter units each having a rated capacity of 3850 g.p.m.

The results shown in Table VI are characteristic of the performance of these units during their 1½ years of service.

TABLE VI

Raw Water												
Turbidity p.p.m.	15	20	20	20	15	15	20	15	18	15	15	
pH	7.6	7.6	7.6	7.6	7.5	7.6	7.6	7.6	7.6	7.6	7.4	
Treated Water												
No. 1 Turbidity p.p.m.	4	4	4	4	5	5	4	5	4	4	4	
pH	7.1	7.1	7.1	7.1	7.0	7.2	7.2	7.0	6.9	7.1	7.1	
No. 2 Turbidity p.p.m.	4	4	4	4	5	4	4	4	4	4	4	
pH	7.0	7.1	7.1	7.0	6.9	7.1	7.2	7.2	7.0	7.1	7.0	
Alum Feed												
No. 1 Gr. per gal.	1.7	1.7	1.7	1.7	1.9	1.9	1.8	1.9	1.9	1.8	1.8	
No. 2 Gr. per gal.	1.8	1.7	1.7	1.7	1.9	1.8	1.8	1.8	1.5	1.8	1.8	

While the performance shown by this table is not as spectacular as that portrayed by the log sheets of Case A, it does emphasize the uniform quality of water produced and such uniformity is of utmost importance in the standardization of plant operations.

As a matter of fact, it is generally more difficult to handle waters which produce a small volume of light sludge than those in which a heavier precipitate in greater volume, as in Case A, is produced.

Specific information on plant operating benefits resulting from the use of water of improved quality provided by the clarifiers in Cases A and B has not been made available for publication. It is known, however, that plant shutdowns previously necessary when excessively bad water conditions existed have been eliminated with consequent improvement in operating efficiency and increased production. These benefits alone more than justify the investment and operating costs involved in the Accelator installations.

Case C

An Accelator softener in a southern pulp and paper mill shown in Fig. 3 comprising a single unit 46 foot in diameter and having a rated capacity of 3500 g.p.m. In this unit selective removal of calcium bicarbonate, the principal offender in causing scaling difficulties throughout the pulp mill, is effected.

Typical of the three-year performance of this unit are the "raw" and "treated" water analyses given in Table VII.

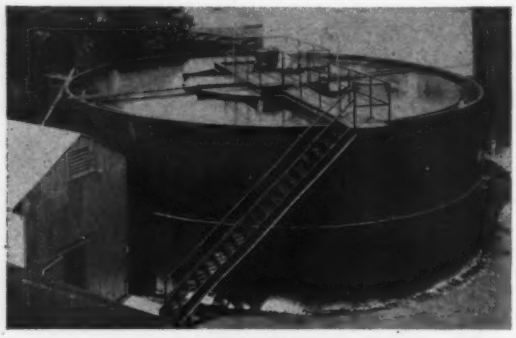

FIG. 3

TABLE VII

	Well Water p.p.m.	Treated Water p.p.m.
Turbidity	2	2
Calcium carbonate	140	34
Calcium sulphate	54	55
Magnesium sulphate	108	103
Magnesium chloride	8	...
Sodium sulphate	...	10
Sodium chloride	20	20
Iron oxide	0.3	0
Silica	23	22
Total dissolved solids	353	244
Total hardness	278	161
Total alkalinity	140	34

Since calcium carbonate only is removed in this treatment process, the sludge produced is practically pure calcium carbonate, which on reburning to produce calcium oxide provides the bulk of the lime required in the causticizing plant as shown by Table VIII.

TABLE VIII.—SELECTIVE CALCIUM CARBONATE REMOVAL

237 p.p.m. calcium bicarbonate requires	82 p.p.m. CaO; produces	293 p.p.m. $CaCO_3$
27 p.p.m. carbon dioxide requires	34 p.p.m. CaO; produces	61 p.p.m. $CaCO_3$
Total amount lime required	116 p.p.m. CaO; produces	354 p.p.m. $CaCO_3$
Less dissolved calcium carbonate retained in effluent		34 p.p.m. $CaCO_3$
Net sludge recovered for reburning		320 p.p.m. $CaCO_3$
320 p.p.m. $CaCO_3$ reburned produces	180 p.p.m. CaO or 1.5 lb. per 1000 gal.	
Less lime CaO fed	116 p.p.m. CaO or 0.96 lb. per 1000 gal.	
Extra CaO dividend	64 p.p.m. CaO or 0.54 lb. per 1000 gal.	

The reburned sludge provides a quicklime for the causticizing plant containing 87.4% available calcium oxide—equivalent in purity to many commercial quicklimes.

Because the softening plant produces lime in excess of the amount required for softening, and since the use of this excess in the causticizing plant replaces lime which would otherwise be purchased, there is no lime cost chargeable to the softening plant, but actually a credit for the lime produced.

Direct benefits derived from the use of treated water are given in Table IX.

TABLE IX

	Using Raw Water	Using Treated Water
Fresh lime required per ton of pulp produced—lbs.	71	15.5
Oakite solution required for "cleanup" per month—carboys	25	4.5
Frequency of evaporator cleanup—weeks	2	13

It is further estimated that overall production has been increased approximately 20% due to reduction in number of mill shutdowns for cleaning.

When the necessity arose for an increased supply of boiler feed-water of improved quality, a second smaller Accelator softener was installed for further softening the treated process water prior to phosphate softening in an existing hot process water softener.

The adaptability of the Accelator for a variety of treatment operations is indicated by the analyses given in Table X.

TABLE X

All figures parts per million

	Raw Well Water	Accelator Effluent for Process	Accelator Effluent for Boilers	Hot Process Phosphate Treated
Calcium carbonate	140	34	25	2
Calcium sulphate	54	55	...	...
Magnesium carbonate	...	...	20	7
Magnesium sulphate	108	103	...	...
Magnesium hydrate	...	...	7	...
Magnesium chloride	8	...	...	...
Sodium carbonate	...	...	24	59
Sodium sulphate	...	10	180	165
Sodium chloride	20	20	20	20
Iron oxide	0.3	0	0	0
Silica	23	22	13	13
Total dissolved solids	353	244	289	266
Total hardness	278	161	61	10
Total alkalinity	140	34	84	66

Note that in addition to reducing the hardness of the water to about 3.5 grains per gallon, the second Accelator also reduces the silica content of the water from 22 to 13 p.p.m. This reduction was sufficient to eliminate silica scale difficulties in the boilers previously experienced.

The hookup of the several treating units is shown in Fig. 4.

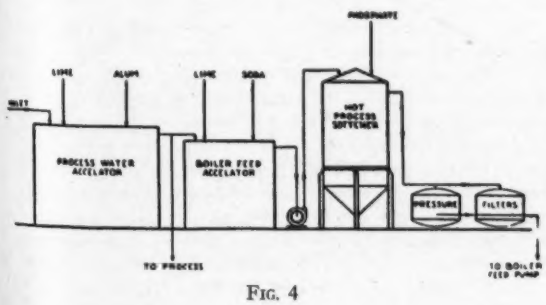

FIG. 4

Case D

An Accelator softener in a southern pulp mill comprising a single unit 63 foot diameter having a rated capacity of 7000 g.p.m. installed for the selective removal of calcium carbonate, as in Case C. Table XI of analyses showing predicted performance vs. actual performance is of interest.

TABLE XI

	Predicted *		Actual *	
	Raw	Treated	Raw	Treated
Color	27	15	55	12
Turbidity	15	10	20	5
Calcium carbonate	145	35	140	25
Magnesium carbonate	89	85	76	55
Sodium carbonate	12	8	25	18
Sodium sulphate	10	16	13	27
Sodium chloride	28	28	23	25
Iron oxide	3	0	3	0
Silica	22	20	17	18
Total dissolved solids	309	192	297	168
Total hardness	251	137	230	91
Total alkalinity	262	144	254	108

* All figures in p.p.m. except color.

Note that actual performance on every score is much better than predicted performance. That the actual performance, as shown, is not based on a particularly favorable period of operation is shown by the data (Table XII) taken from a typical daily log sheet.

TABLE XII—LOG SHEET

Time	Flow g.p.m.	Draft Tube Slurry	Draft Tube P Alk.	Draft Tube M. Alk.	Treated Water P Alk.	Treated Water M Alk.	Treated Water Turb.
7A	6360	3%	48	104	45	100	under 5
8	6360	3	45	100	44	96	5
9	6360	2½	46	103	47	99	5
10	6480	3	47	105	47	102	5
11	6480	2½	49	106	46	100	5
12	6280	2½	47	102	47	100	5
1P	6280	2½	48	104	46	99	5
2	6480	2½	47	103	47	101	5
3	6480	3	50	100	51	100	5
4	6480	3	49	104	50	100	5
5	6480	3	51	105	50	104	5
6	6480	3	48	105	49	100	5
7	6480	3	51	81	51	96	5
8	6480	3	50	100	50	85	5
9	6360	3	57	102	50	100	5
10	6360	3	50	103	50	100	5
11	6360	3	46	120	40	110	5
12	6480	3	50	110	42	110	5
1A	6480	3	50	105	49	100	5
2	6480	3	50	105	49	100	5
3	6480	3	50	105	48	98	5
4	6480	3½	49	105	50	102	5
5	6480	3	48	100	50	100	5
6	6480	3	50	100	48	100	5

These data exemplify the consistency of results obtained in the two years the unit has been in operation, and also bring out a point in connection with Accelator operation to which reference was previously made.

In discussing the principles of operation, attention was called to the fact that "the entering water and recirculated slurry pass from the primary mixing chamber into secondary mixing and reaction zones where slow stirring and continued sludge contact bring treatment reactions to equilibrium before discharge into the outer portion of the Accelator for solids separation." Note from the log sheet that alkalinities of samples from the draft tube after only 15 or 20 minutes contact with treating chemicals and recirculated slurry are practically the same as those of the treated water. The speed with which reactions take place and sludge is formed are thus graphically demonstrated.

Direct plant benefits credited to the use of treated water are a 14% increase in production capacity of black liquor evaporators; a reduction in chlorine demand for slime control from 650 to 250 pounds per day; water piping corrosion minimized; paper and pulp color improved; and pulp washer capacities increased.

The data provide a fairly comprehensive picture of the characteristics of the treated water produced by the Accelator in various water treating applications. One point, however, is not brought out and that is the efficiency in utilization of treating chemicals.

In softening, practically 100% utilization of softening chemicals is obtained as evidenced by the fact that concentrated slurry discharged contains no unreacted treating chemicals. In clarification, Accelator clarifies almost invariably require a lesser dosage of coagulating chemical than other previously used types of coagulating and clarifying equipment.

Similar operating and performance data on many other installations could be presented, but the information submitted suffices to show the adaptability of the Accelator to various water treatment processes, and its exceptional performance on such applications.

The potential possibilities of equipment of any type are of value to the user only to the extent these possibilities are realized under ordinary, every day, plant operating conditions. The data presented herewith, taken from actual operating records extending over periods of 1½ to 3 years, clearly show that predicted performance is not only attained, but actually bettered under ordinary plant operating conditions.

Additional Information

1. Behrman, A. S., "Water Purification to Meet Paper Mill Requirements," *Tech. Assoc. Papers* 20:183-187 (1937).
2. Richter, R. C., and Lammers, F. J., "Water Treatment at National Container Paper Mill," *Tech. Assoc. Papers* 24:422-424 (1941).
3. Frazer, H. W., "Calcium Bicarbonate Removal from Water in Sulphate Mills," *Tech. Assoc. Papers* 25:173-176 (1942).

Refractory Selection and Maintenance Problems*

By Dave W. Wuerthele[1]

Abstract

The selection of refractory or several types of refractories is determined by the inherent characteristics of the refractories to meet the operation conditions. No one refractory can serve successfully for all sets of conditions. Preventive maintenance requires careful analysis of failures to provide the basis for selection of the most suitable refractory for each use requirement.

Because all furnace linings eventually wear out, the primary refractory problem facing the consumer is maintenance. Refractory maintenance can be approached in two ways. Either it can be regarded as a necessary evil to be overcome at the least possible expense with the idea that, "after all, it must be done over again soon, anyway"; or it can be approached as an engineering problem akin to the proper design of a part of a complex machine. In the latter case, the result is low operating cost and the maximum of continued operation free from outage loss.

To correctly appraise the causes which necessitate repairs to fire brick linings, the causes of previous failure should be carefully determined. Unfortunately, to the uninitiated, the causes of refractory failure are frequently not readily apparent, and when they are often misleading. In addition, the apparently "easy to read failures" are often far more complicated than they appear on the surface. It is, therefore, a real problem to correctly diagnose refractory ills.

To practically all pulp and paper manufacturers, the most important cost figures for refractory maintenance are those for maintaining the linings in the steam generating plants and the rotary burners used for processing the materials for manufacturing their products. Steam for manufacturing purposes is universal in all paper plants, and boiler refractory maintenance is a common and oft-repeated repair problem.

Furnace Linings

The ultimate life of fire brick linings is of course a function of the boilers in which they are installed. Factors to be considered are: kind of fuel, method of firing, B.t.u. release, type of boiler, cycle of heating. All of these functions are interrelated to each other, and they must all be taken into account in order to determine the correct type of refractory to best withstand all of the conditions encountered.

Since the paper industry, due to its wide-spread geographic location, can be expected to have boilers fired with anything from bagasse to natural gas, the first consideration should be the type of fuel and the impurities contained therein.

To enter into a discussion of these impurities would entail a paper devoted to that subject alone. It will have to be assumed that the various impurities in different types of fuel are extremely important. This is true because at elevated temperatures the fuel impurities frequently act as violent fluxes. These fluxes, through chemical reaction, have the effect of reducing the fusion point of the brick, thereby making it easy prey to failure because of its reduced softening point. This causes lower structural strength, greatly increased vitrification, less resistance to erosion and abrasion, and highly increased spalling.

The method of firing is important as for example oil firing *versus* coal firing. In the case of coal firing, there is a heavy bed of fuel on the grate which necessitates a period of time to bring the boiler to temperature and by the same token a period of time to cool. As a result, this reservoir of heat means that the firebrick linings are brought up to temperature slowly and naturally allowed to cool slowly. This cycle is beneficial for the life of refractories. In the case of oil, gas, shavings, or any other quick-flashing fuel, the rate of heating on the face of the refractories is faster than the rate of heat transmission through the body

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of the refractory. As a result, the unequal expansion strains set up are severe. When taking the boiler off the line for cooling, strains are renewed and the heat liberation of the face of the brick is much more rapid than the liberation of heat of the balance of the wall. This causes severe cracking or spalling.

The British thermal unit release per cubic foot in a boiler is important, as it is a direct cause of fusing or melting of brick, when the B.t.u. release is too great for the type of brick employed. Since the design of the fire box and the black-body radiation area is so variable from boiler to boiler, it is impossible to dwell lengthily on the subject. There are certain rules of thumb sometimes used in determining the correct refractory to be used. In this case, however, there are so many variables, it is not safe to use any hit-or-miss method.

The many types of boilers and the difference of firebox design employed, together with the steaming characteristics must be taken into account. Horizontal return tube boilers will, by their very design, cause certypes of refractory failures that will not be encountered in water tube boilers for instance. As in any type of equipment different designs can be expected to show trouble in certain well-defined places. The nature and cause of trouble will determine the type of refractory to be used in combating difficulties.

The cycle of a boiler and its steam requirements are of vast interest to the investigator of refractory ills. When the demands of a boiler are such that the steam output, and thus the fires, remain reasonably constant day in and day out, the failures caused by rapidly fluctuating temperatures are of course not encountered. However, when the load of a boiler varies from day to day or from hour to hour the firebox temperatures may raise and lower several hundred degrees at frequent intervals. This imposes a severe strain on the refractories due to unequal expansion and contraction and the result after a time is failure from spalling. In addition, the constant movement of the walls causes eventual looseness, shearing of the headers, and bulging. This means that often repairs are necessary, not necessarily because of brick failure but because of structural failure. This is especially true of boilers set in battery and fired alternately. It is also common for battery-set boilers to show an earlier failure of the battery wall due to the fact that radiation is much faster through the outside wall than the battery wall. At this point it might be interesting to mention that the same brick will show entirely different characteristics when entirely surrounded by heat as when set in a wall where heat radiation loss is fairly rapid.

Selection of Furnace-Lining Material

It is important to point out the steps necessary to overcome failure by the correct choice of a refractory which will best meet most of the contributing causes of failure. Since there is no such thing as a cure-all in fire brick, it then becomes necessary to select the type of refractory which will best withstand the greatest combination of the most destructive forces.

In the order given above, the type of fuel and its impurities shall be considered first. To best combat fluxing and its attendant evils a refractory should be chosen which is free enough, in itself, of chemical impurities to retard reaction with the constituents of the ash of the fuel. It should also be sufficiently dense in structure to resist penetration of various fuel slags. To use the simplest illustration of the wisdom of this course consider a coal-hred boiler lined with a brick which is rather porous in texture. The iron and alkalies of the fuel ash have reacted and are in a molten state. They come in contact with the refractory which has softened to a certain degree depending upon the temperature of operation. The alumina and silica of the refractory readily combine with the iron and the alkalies of the fuel ash to form new compounds which are not refractory at all but are feldspars which are fluxes. This action causes a corrosion of the refractory which quite often is rapid and severe.

At times this slag action is the most destructive factor to be considered and therefore it is best to have a refractory which will be least affected by the chemical constituents of the slag. If a refractory low in impurities is chosen, it will take a relatively higher amount of fuel impurities to form a given percentage of fluxing, such as would be the case in the formation of sodium aluminum silicate or the mineral nephelite.

In the case of the porous brick, the slag could be considered to have penetrated into the pores of the brick in the molten state when it might freeze, but still be attached to a larger source of the slag in the fuel bed. This when cooled would form a clinker slag which would call for the action of the slice bar. As the slice bar was used on the slag, it would naturally pull away parts of the refractory to which the slag has been attached by freezing and thus the wall could literally be torn away. This calls for a dense refractory to resist the penetration of the slag and one which is strong and will withstand this abrasion of the slice bar.

The method of firing a boiler is a source of refractory problems also as the rapidity with which the unit can be brought to temperature is, in most cases, dependent upon this. The reference is of course to solid fuels such as coal, etc., and on the other hand to gaseous or liquid fuels.

In the case of solid fuels, there is a heat reservoir or source of latent heat which is far easier on refractories than gaseous fuels. The limitations of this type of fuel are that it takes longer for elevated temperatures to be reached, when the boiler is put on the line and inversely longer for the boiler to cool. This enables the refractories to go through their expansion and contraction stages or to put it another way, their stages of physical readjustment so slowly as to greatly minimize the strains of different growths in one solid piece of brick.

In the case of the nonsolid fuels, the rate of heat absorption is extremely rapid since the heat of the burner is transmitted directly to the fire brick wall immediately. The medium of heating a boiler is by radiation and convection; therefore, the more rapidly the walls become hot, the more rapidly the heat is transmitted to the tubes, drums, or other black-body area. As a result, the heating is as rapid as the brick will absorb it; and the brick cools as rapidly as possible when the burner is turned off, because there is nothing to retard the rate of heat loss. This means that the inner or furnace surface of the brick is heated much faster than the heat can be transmitted through the brick and as a result the surface has a tendency to expand more than the body of refractory behind it. On the cooling cycle, the surface of the brick loses its heat faster than the mass behind it and tends to contract before the rest of the refractory. In both cases, the strain of unequal expansion or contraction is often greater than the bond strength of the brick

and severe spalling is encountered. Obviously there is practically no problem from this score with solid fuel, but it is a major problem with gaseous or liquid fuels. It then is indicated that a brick having excellent bond strength and maximum resistance to spalling should be chosen. Above all, the brick should be chosen which has the absolute minimum of expansion or contraction. Refractories of these characteristics are found in the Missouri field. Not only is the spalling factor important, but the constant movement of the walls due to excessive expansion and contraction is such as to cause early failure due to sheared headers and loosening of the structure.

One of the most frequent misapplications of refractories takes place when the B.t.u. release of a boiler is not correctly considered. First, consideration should be given to the B.t.u. release at its peak during boiler operation, not its average. There are many angles to study in B.t.u. release which are not immediately apparent. There is the question of black-body surface and its relation to B.t.u. release both in area and the relation of such area to the radiation surfaces of the refractory.

For instance, a refractory used in a boiler which has a high, narrow fire box with the black-body area high above the grates or burners will have a much shorter life than the same refractory used in a fire box which is much lower and wider, both boilers having, of course, the same B.t.u. release. The reason for this is that the percentage of black-body to heat-radiating surface would be much less in the first illustration than in the second. The result is that considerably more heat would be absorbed into the refractory to force the radiated heat to the high black-body than would be the case in the lower setting. This means that a much more severe condition would be imposed on the high narrow setting due to concentrated heat in a confined area.

If the boiler design is such that a high narrow setting is the problem, then a refractory must be used which has an extremely high softening point and maximum resistance to elevated temperatures regardless of fuel used. The resistance to high temperatures means a high-fusion point to prevent softening. In time, the prevention of softening is important to prevent the squatting of the lower courses of brick due to the weight of the high setting above. Naturally the temperature imposed on the walls lessens toward the top, and the most severe conditions apply at the lower part of the wall where the weight is greatest. It should be mentioned here that a careful selection of brick is indicated, because at extremely high temperatures some refractories will shrink and this is as much of a fault or more than excessive expansion. Extremely high temperatures bring about extreme vitrification which causes a dense, brittle structure on the face of the brick and extending into the brick as far as the excessive temperatures have permeated. A structure of this nature has no resistance to cracking or spalling whatever and on subsequent heating and cooling cycles of the boiler will disintegrate completely. Further vitrification of a refractory occurs after it reaches the temperatures at which it was fired. Up to a point this is beneficial; however, some refractories will have a much lower dangerous vitrification point than others. Care should be taken to see that a refractory is used which offers the utmost in resistance to extreme vitrification and usually this means a selection of a super duty or high alumina refractory from the Missouri field.

To correct the severity imposed on refractories by rapidly fluctuating load conditions, a refractory must be selected which can withstand successfully the normal causes of failure which are greatly accelerated by the varied loads.

Kilns

The selection of refractories for use in various types of kilns is no less important than for other operations. Because of the nature of the materials processed and the method of treatment involved, careful analysis is required to select the refractory best adopted for a particular service.

Necessary properties of linings in these uses are high refractoriness, close texture, good resistance to penetration by slags and fluxes, minimum tendency to fail through thermal spalling and pinching, mechanical strength at elevated temperatures and resistance to abrasion. Conditions in handling different materials and in different zones of kilns require greater emphasis on individual properties. In the cold zone, where wet sludge may be charged into a rotary kiln, close texture and resistance to penetration are of primary importance. On the other hand, in the burning zone high refractoriness is the first consideration. In the hot zone, which is intermediate between the cold zone and the burning zone, the required refractory properties of both these zones must be balanced. At the discharge end resistance to spalling and abrasion require first consideration. Special attention is required when handling materials which act as fluxes on fire brick linings.

The refractories industry over a period of years has spent considerable time in research in order to develop materials adapted to various conditions in rotary kilns. As a result, to overcome extremely severe conditions, special mixes have been developed to combat refractory trouble and aid in longer life. Based on past experience, most often a choice of a high-quality refractory will successfully meet conditions; however, when excessively severe problems are encountered laboratory tests for physical and chemical reaction, and simulative service data will be of great assistance.

Conclusion

From the foregoing it must be apparent that no one refractory can combat all of the conditions which may be imposed. Therefore, it appears that a careful analysis should be made to determine what are the principal causes of failure and those which occur most often. After having determined this, the selection of refractory or several types of refractories to be used will be dictated by the inherent characteristics of these refractories to successfully meet the conditions.

In many cases the use of a good grade of plastic fire brick can offer a solution which will be highly successful. This is true also of castable refractories, either of the heavy or insulating type. High-temperature cements justify their use as any fire-brick setting is no stronger than its bond and the good quality high-temperature cement will provide a joint stronger than the brick itself. The merits of refractory specialty products should be seriously noted.

A note of caution should be mentioned here as very frequently the causes of failure cannot completely be determined by a surface inspection. It is often necessary to examine the structure of a refractory to fully analyze the cause of failure. Advantage should be taken of the services of a thoroughly trained refractory engineer, because the manufacture and application of refractories is of a highly specialized engineering nature.

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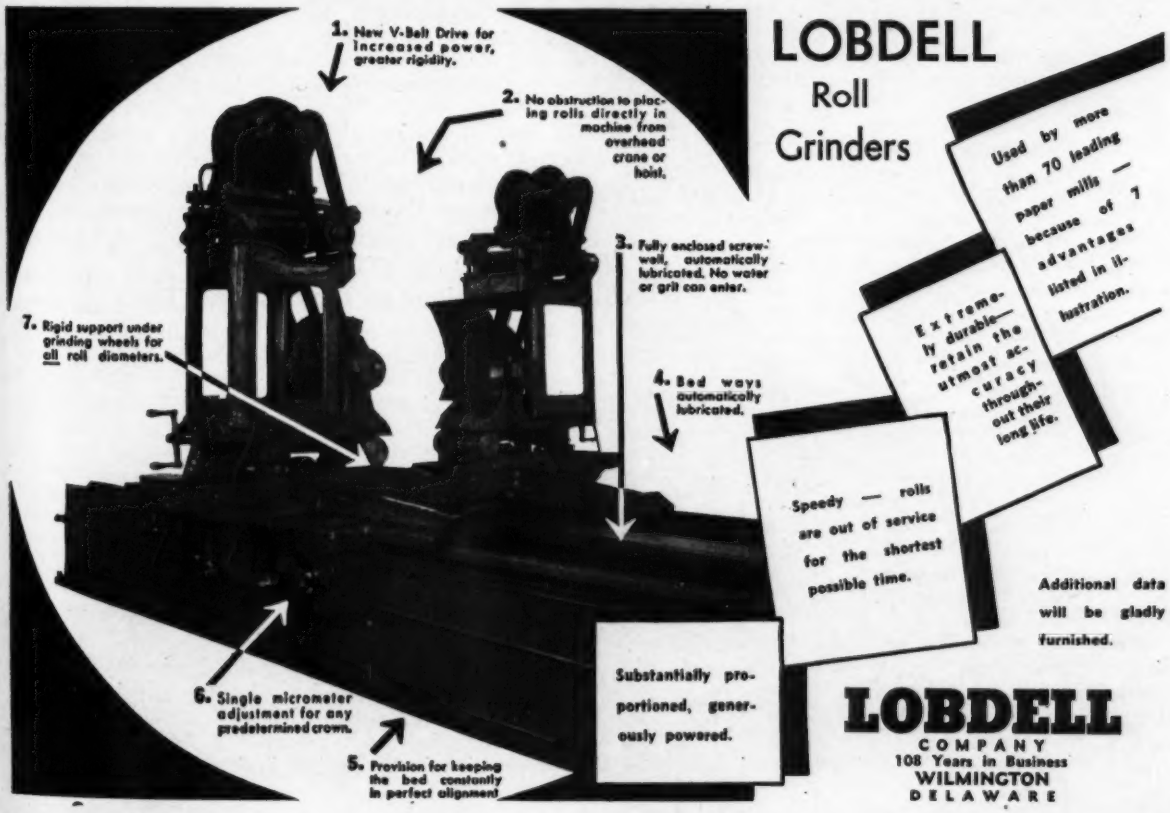
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Issues Government Paper Needs

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., May 12, 1943—Total Federal and non-war agency paper requirements in 1943 will be 1,000,000 tons, approximately, Donald J. Sterling reported to a House subcommittee of the committee on Interstate and Foreign Commerce, in a statement originally intended for presentation by Chairman Donald Nelson, of the War Production Board. Mr. Sterling is a special advisor on newspapers, at WPB.

Of 85 federal agencies, 78, which include all of the large users of paper, report their 1943 requirements as follows, Mr. Sterling continued:

Newsprint, 55,092 tons; groundwood paper, 104,295 tons; book paper 68,548 tons; fine paper 289,628 tons; all other, wrap, tissue, sanitary, building paper, etc., 480,791 tons.

The War Department (Army) accounts for something under half the aggregate, he said, with Lend-Lease requirements second, Board of Economic Warfare third, and Navy Department fourth. Post Office, Treasury, and Office of Emergency Management, are next in order, and Mr. Sterling added that returns from the few agencies not yet reporting their requirements would not alter the total as much as 1%. Total printing paper requirements of the federal government represent a downward revision of 310,044 tons from February 5 figures, or 42.3%, it was pointed out.

Maintenance of a proper balance between pulp and paper production, and newsprint and print paper consumption is essential, Mr. Sterling declared. At the same time warning that third quarter production this year may suffer. The statement was originally scheduled to be read by Chairman Donald Nelson, of WPB.

Explaining that current paper restrictions were essential to meet requirements of the armed forces for various types of paper ranging from container materials to building paper, Mr. Sterling said production possibilities of the pulp and paper industry on the North American continent this year are dependent on the amount of pulpwood available.

"United States and Canadian authorities estimate that the 1943 supply of pulpwood will be 25% less than in 1942," the witness stated. "Some areas are off as much as 43%. These reductions are primarily due to lack of manpower in the woods."

He gave domestic newsprint production for the first quarter of 1943 as 82.6% of the peak period, October, 1941-March, 1942, although mills were permitted to operate at 90% of base period production. United States producers, he continued, estimate second quarter production will be 86.5%, but warned that this can only be attained by a dangerous drain on wood inventories.

To supplement woodpulp and pulpwood supplies of the United States, he reported, a Canadian agreement has been ratified, April 15, to supply the United States during 1943, with 1,278,000 tons of pulp, which includes an addition of 107,000 tons during the second quarter, plus 1,500,000 cords of wood, for other than newsprint paper.

Newsprint production in North America for the second quarter was placed at 950,747 tons, he stated, divided as follows: Canada, 73.3%, Newfoundland 4.5%, United States 21.6%. This production was only 77.2% of the peak rate. The second quarter output of book paper, he said, 79.1% of peak, was maintained only with the help of 107,000 tons of Canadian pulp above the regular commitment. Canada has advised that this cannot be furnished for the third quarter, so that "it may not be possible to maintain current level production during the third quarter without drawing inventories of pulpwood and pulp to a very low level," Mr. Sterling warned.

E. H. Hall Buys Control

Through a reorganization effected within the last ten days, control of Fitchburg Duck Mills, one of the country's oldest producers of paper mill dryer felts and cotton duck, passed into the hands of Edward H. Hall.

Mr. Hall is president and general manager of Fitchburg Screen Plate Company, Inc., manufacturers of screen plates for the pulp and paper industry and is also proprietor of Morey Paper Mill Supply Company. Morey is one of the oldest mill supply houses serving the paper trade, having been in continuous operation for over 50 years and selling the paper mills dryer felts, screen plates, deckle webbing, carrier rope, machine aprons, etc.

While the Morey company will act as general sales agents for the Fitchburg Duck Mills in their sale of dryer felts, nevertheless the various agencies now handling Fitchburg Duck products will be retained with very few exceptions. Sales, however, will be immediately expanded to cover the entire country with a wide variety of dryer felts, including the Triune 3-ply Weave, the Multiple 2-ply Weave, the Diamond-Back (open-back) Weave, and the fine Baker or English Weave dryer felts.

The Fitchburg Duck Mills also has a pre-stretching and shrinking machine so that any of their felts can be processed before shipment. The company also manufactures cotton duck for war orders and, at present, is developing a new heavy impregnated cotton fabric for use in soles of shoes, replacing leather.

Fitchburg Duck Mills was established in 1844 and has been in continuous operation at the same location for nearly 100 years. In the old days they manufactured great quantities of sail cloth for the Clipper ships, and their products have been in demand and of very high reputation ever since.

Michigan to Hold Round Table

A meeting of the Michigan Division of the American Pulp and Paper Mill Superintendents Association will be held on Thursday, May 20, at the Park American Hotel, Kalamazoo. Dinner will be served at 6:30 P. M. The program will consist of a round table discussion of present day papermaking problems. At least eight questions will be brought up and a fifteen minute discussion devoted to each. All attending are invited to submit questions.

Walter Hicks Joins Navy

Walter R. Hicks, president of Daniel M. Hicks, Inc., papermaking supplies, 565 Fifth avenue, New York, has been commissioned an Ensign in the Navy.

Mr. Hicks left on May 1 to enter the Naval Training Station at Harvard University, Cambridge, Mass., for an intensified training course in communications in preparation for active duty in the Navy.

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Pure Titanium Dioxide

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New York Paper and Pulp Market Review

Demand For Paper Continues at High Level—WPB Invokes Withholding Clause of Wood Pulp Order M-93—OPA Names Pulpwood Prices in Some Southern States—Old Waste Paper Market Strong.

Office of the PAPER TRADE JOURNAL.
Wednesday, May 12, 1943.

All major grades of paper are in active demand, according to most of the many reports received from many manufacturers' representatives, jobbers, and general paper merchants during the current week. Reports also widely comment on manpower shortages and transportation and delivery difficulties, which are hampering the distribution of paper products for civilian use.

The index of general business activity declined to 135.7 for the week ended May 2, from 138.0 for the previous week, compared with 133.1 for the corresponding week last year. The index of paper board production was 134.6, compared with 152.7 for the previous week, and with 151.1 for the corresponding week last year.

Paper production for the week ended May 1 was estimated at 85.7%, compared with 100.1% for 1942, with 99.8% for 1941, with 89.3% for 1940, and with 83.6% for the corresponding week for 1939.

Paper board production for the week ended May 1 was 89.0%, compared with 90.0% for 1942, with 83.0% for 1941, with 77.0% for 1940, and with 68.0% for the corresponding week for 1939.

The OPA on May 5 stated the recent $5 per ton increase in price granted to manufacturers of kraft wrapping and bag papers, applies only to such grades as are specifically referred to in Maximum Price Regulation No. 182. All other kraft papers, including converting grades, as gumming, envelope, coin wraps, tire wraps, etc., are under Maximum Price Regulation No. 129, which freezes maximum prices as of October 1-15, 1941. The OPA declares that any increase in the prices of these kraft papers is a violation of Maximum Price Regulation No. 129.

The OPA also announced last week that producers of paper board sold east of the Rocky Mountains, and their customers, must preserve records of sales or purchases aggregating 10 tons or more, as long as The Emergency Price Control Act of 1942 remains in effect.

Pulpwood

The OPA announced on May 4 that all pulpwood produced in South Carolina, Georgia, and Florida, has the following ceilings, per cord, f.o.b. car or barge: Southern Pine, $6.80; Rough Southern Hardwoods, $7.30; and Peeled Southern Hardwoods, $10.

Wood Pulp

Reports from the West indicate that the production of wood pulp for the 1st 1943 quarter was about 18.5% below the output for the corresponding period in 1942. Wood pulp (all grades) for the above stated quarter aggregated 2,268,000 tons in 1943, compared with 2,784,000 tons in 1942.

The withholding clause of General Preference Order M-93 was invoked by Supplementary General Preference Order M-93-a, which became effective on May 10. This order directs that all producers hold 20% of their production of all types of wood pulp during the month of June, and each month thereafter, and to make deliveries of such withheld tonnage only as ordered by the WPB.

Rags

Mill buying of colored cuttings is reported fair. No. 1 white shirt cuttings and unbleached are rather quiet, with sales under ceiling prices.

Roofing rags are strong under a heavy demand. Ceiling prices are firmly maintained.

Old Rope and Bagging

The old rope market is firm, with all imported fibers in heavy demand and supplies of No. 1 Manila scarce.

Scrap bagging prices are nominal. This market is firm, as it awaits government price fixing and regulation.

Waste Paper

The paper stock market is firm, with prices at ceiling levels. Mill buying of the higher grades, as shavings, envelope cuttings and ledgers, is reported active.

Amendment No. 2 to Maximum Price Regulation No. 30, directs that payment of charges for processing waste paper may not be so high as to increase the cost of such paper stock above maximum prices.

Twine

The twine market is strong as demand continues in excess of supplies. Prices on all standard grades of hard and soft fiber twines are very firm.

Workers Honored For Long Service

[FROM OUR REGULAR CORRESPONDENT]

PHILADELPHIA, Pa., May 10, 1943—The Foremen's Club of York recently honored members who have had more than 25 years of continuous service with their present employers, and issued new certificates to a number of members who have recently completed the 25-year stretch or have added another five years to their records. Signally honored were representatives connected with paper mills in this area. In the 50 year group Daniel S. Baker, P. H. Glatfelter Company, was among those with this enviable record. In the 40 year group was John A. Fultz, P. H. Glatfelter Company. In the 35 year group were S. C. Wentz and H. F. Mahaley, both of the Glatfelter Company, and H. D. Quickel of Schmidt and Ault Paper Company. In the 30 year group were Allen Beck, E. F. Hawkins, W. S. McClellan of the Glatfelter Company, together with Samuel A. Hummer, Southern Kraft corporation, and Harry R. Serf, Schmidt and Ault Paper Company. In the 25 year group were Henry D. Schmidt, and George A. McCoy, Schmidt and Ault Paper Company; Philip H. Glatfelter, Leonard Becker, Joseph P. Trone and William L. Hartman, of P. H. Glatfelter Company; and John B. Koch, Southern Kraft Corporation.

"NON-USERS ARE THE LOSERS"

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Nobody knows how long the war will last. Nobody knows how long a felt will last. But, — over the half century that TENAX have served the paper and fibre producers, they have built up a medal-winning record. On the machines and the production charts, both, their service record is outstanding.

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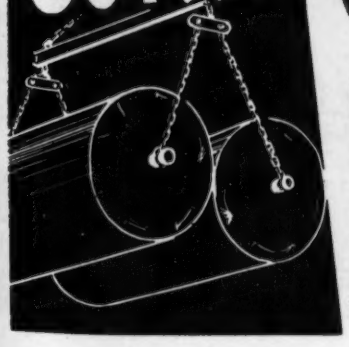

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For all uses requiring an extremely tough non-returnable paper mill core.

DURO—Standard returnable core of plus-standard quality. Shown with Taylor ends. Also available with Bermico ends.

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BERMICO*—A returnable fibre core—extremely hard, strong and rugged. Treated to resist weather and moisture changes.

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DEPENDABLE SOURCE OF SUPPLY

MISCELLANEOUS MARKETS

Office of the PAPER TRADE JOURNAL.
Wednesday, May 12, 1943.

BLANC FIXE—Prices on blanc fixe are firm and continue unchanged at prevailing market levels. The pulp is currently quoted at $40 per ton in barrels, at works; the powder is offered at $60 per ton, f.o.b., works. Demand reported fair for the week.

BLEACHING POWDER—Prices on bleaching powder are firm. Current demand reported active. Bleaching powder is currently quoted at $2.50 per 100 pounds, in drums, at works.

CASEIN—OPA maximum prices on processed acid-precipitated casein are as follows: 100 bags or more, 21 cents per pound; 20 bags, 21¼ cents per pound; less than 20 bags, 21¾ cents per pound, f.o.b., shipping point.

CAUSTIC SODA—Prices on caustic soda are reported unchanged. Demand for the current week is reported active. Solid caustic soda is currently quoted at $2.30 per 100 pounds; flake and ground at $2.70 per 100 pounds, in drums, at works.

CHINA CLAY—Quotations on china clay are firm and continue unchanged. Demand reported fair for the current week. Domestic filler clay is currently quoted at from $7.50 to $15 per ton; coating clay is quoted at from $12 to $22 per ton at mine. Imported clay is quoted at from $13 to $25 per long ton, ship side.

CHLORINE—Quotations on chlorine unchanged. Government demand for war use continues heavy. Supplies larger. Prices firm. Chlorine is currently quoted at from $1.75 per 100 pounds, in single-unit tank cars, f.o.b., works.

ROSIN—Quotations on some grades of rosin are higher for the current week. "G" gum rosin is currently quoted at $3.52 per 100 pounds in barrels, Savannah. "FF" wood rosin is currently quoted at $3.44 per 100 pounds in barrels, New York. Seventy per cent gum rosin size is currently quoted at $3.71 per 100 pounds, f.o.b., works.

SALT CAKE—Prices on salt cake are firm. Demand reported moderate for the current week. Domestic salt cake is currently quoted at $15 per ton in bulk; chrome salt cake at $16 per ton. All prices in car lots, f.o.b., shipping point.

SODA ASH—Quotations on soda ash are firm and continue to conform to prevailing market quotations. Demand heavy. Quotations on soda ash in car lots, per 100 pounds, are as follows: in bulk, $.90; in paper bags, $1.05; and in barrels, $1.35.

STARCH—Prices on corn starch continue to be reported unchanged for the current week. Pearl is currently quoted at $3.10 per 100 pounds; powdered starch at $3.20 per 100 pounds. All prices in bags, car lots, f.o.b., Chicago.

SULPHATE OF ALUMINA—Quotations on sulphate of alumina are firm. Supply more limited for the current week. The commercial grades are currently quoted at $1.15 per 100 pounds; iron free at from $1.75 to $1.85 per 100 pounds, in bags, car lots, f.o.b., works.

SULPHUR—Prices on sulphur are firm and continue to conform to prevailing market quotations. Annual contracts are currently quoted at $16 per long ton, f.o.b., mines. Spot and nearby car lots are quoted at $18 per ton.

TALC—Quotations on talc are firm and continue unchanged at prevailing market prices. Domestic talc is currently quoted at from $16 to $21 per ton, at mills. No quotations on imported talc.

MARKET QUOTATIONS

All market quotations, excepting those otherwise designated as official OPA maximum prices, are based on the manufacturers' price level as of October 1-15, 1941; maximum wholesale prices are based on the merchants' maximum prices for stipulated quantities at a quoted price to all customers of a like class, as shown by the merchant's sales records of goods delivered during March, 1942. A merchant's price list in effect in March 1942, showing quotations of actual shipments, will establish the current maximum prices.

Paper

(Delivered New York)

News, per ton—			
Roll, contract	*$54.00	@	—
Sheets	62.00	"	—
* OPA Maximum Price.			
Kraft—per cwt.—Car'oad Quantities Zone A, f.o.b. Mill			
Superstandard Wrapping	*$5.25	@	—
No. 1 Wrapping	*5.00	"	—
Standard Wrapping	*4.75	"	—
Standard Bag	*4.375	"	—
* OPA Manufacturers' Prices.			
Tissues—Per Ream—Carlots			
White No. 1	1.12½	"	—
White No. 1 M. G.	1.10	"	—
White No. 1½	1.00	"	—
White No. 2	.90	"	—
Anti-Tarnish M.F.	1.20	"	—
Colored	—	"	—
Kraft	.95	"	—
Manila	.90	"	—
Toilet—1 M. Sheets—Per Case			
Unbleached	4.25	"	—
Bleached	5.70	"	—
Unbl. Toilet, 1 M.	4.16	"	—
Bleached Toilet	5.70	"	—
Paper Towels, Per Case—			
Unbleached, Jr.	2.60	"	—
Bleached, Jr.	3.20	"	—
Manila—per cwt.—C. l. f. a.			
No. 1 Jute	11.25	@	—
No. 1 Manila Wrapping, 35 lb.	6.00	"	6.25
No. 2 Manila Wrapping, 35 lb.	5.75	"	6.00
Boards, per ton—			
News	*48.00	@	—
Chip	*45.00	"	—
Sgl. Mla. Ll. Chip	*60.00	"	—
White Pat. Coated	*75.00	"	—
Kraft Liners 50 lb.	*63.00	"	—
Binders Boards	84.00	"	116.00

* OPA Base Prices per 10 tons. Less than 10 tons but over 3 tons, add $2.50; three tons or less, add $5; regular 35-39 basis, add $5.; basis 40-49, add $2.50; basis 91-100, add $2.50; basis 101-120, add $5.

The following are representative of distributors' resale prices:

Rag Content Bonds and Ledgers—White, Assorted Items, Delivered in Zone 1:

	Bonds	Ledgers
100% Rag Ext. No. 1	$39.10@$46.00	$40.25@$47.25
100% Rag	32.20 " 37.75	33.35 " 39.25
85% Rag	.... "	29.90 " 35.00
75% Rag	23.00 " 27.00	24.15 " 28.25
65% Rag	.... "	22.80 " 27.75
50% Rag	18.70 " 22.75	19.90 " 24.25
25% Rag	16.40 " 20.00	17.55 " 21.50

Colors at $1.00 cwt. extra.

Sulphite Bonds and Ledgers—White, Assorted Items. Delivered in Zone 1:

	Bonds	Ledgers
No. 1..	$10.55@$12.75	$11.70@$14.25
No. 2..	9.65 " 11.75	10.80 " 13.25
No. 3..	9.20 " 11.25	10.35 " 12.50
No. 4..	8.90 " 10.75	10.05 " 12.25

Colors $1.00 cwt. extra.

Free Sheet Book Papers—White, Cased Paper. Delivered in Zone 1:

No. 1 Glossy Coated	$13.65	@	$13.50
No. 2 Glossy Coated	12.40	"	14.00
No. 3 Glossy Coated	11.60	"	13.25
No. 4 Glossy Coated	11.15	"	12.75
No. 1 Antique (watermarked)	10.25	"	11.75
No. 2 Offset	9.60	"	11.00
A Grade E. F.	9.35	"	10.75
A Grade S. & S. C.	9.60	"	11.00
B Grade E. F.	8.85	"	10.25
B Grade S. & S. C.	9.10	"	10.50
C Grade E. F.	8.55	"	9.75
C Grade S. & S. C.	8.80	"	10.00
D Grade E. F.	8.25	"	9.50
D Grade S. & S. C.	8.50	"	9.75

Ivory & India at $.50 cwt. extra.

Wood Pulp

OPA Maximum Prices and Canadian Manufacturers Prices, Less Freight to Destination.

Bl. Softwood Sulphite	$76.00
Unbl. Softwood Sulphite	66.00@ 66.00
Bl. Hardwood Sulphite	73.50
Unbl. Hardwood Sulphite	63.50
Bl. Mitscherlich	81.00
Unbl. Mitscherlich	72.00
N. Bleached Sulphate	86.00
S. Bleached Sulphate	79.00
N. Semi-Bleached Sulphate	62.00
S. Semi-Bleached Sulphate	75.00
N. Unbl. Sulphate	73.00
S. Unbl. Sulphate	63.50
Bl. Soda	66.00
Unbl. Soda	62.00
Groundwood	46.00

Transportation Allowances Applying to Producers of Wet Wood Pulp.

	Below 50% Air Dry Weight
Northeast	$13.50
Lake Central	13.50
Southern	16.00
West Coast (in area)	10.50
West Coast (out area)	16.50

	50%-80% Air Dry Weight
Northeast	$11.50
Lake Central	11.50
Southern	14.00
West Coast (in area)	9.50
West Coast (out area)	15.50

Applying to Producers of Dry Wood Pulp.

	Above 80% Air Dry Weight
Northeast	$8.50
Lake Central	8.50
Southern	11.00
West Coast (in area)	7.50
West Coast (out area)	13.50

Should freight charges actually exceed these allowances, the difference may be added to the maximum prices

Domestic Rags

New Rags (Prices to Mill f. o. b. N. Y.)

Shirt Cuttings—			
New White, No. 1	6.50	@	7.25*
Silesias No. 1	—	"	5.75*
New Unbleached	6.75	"	7.50*
Blue Overall	—	"	5.50*
Fancy	—	"	3.50*
Washables	—	"	3.00*
Bleached Khaki Cuttings	—	"	4.25*
Unbleached Khaki Cuttings	—	"	3.50*

* OPA Maximum Prices.

West Virginia Pulp and Paper Company

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35 East Wacker Drive
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Offset, Envelope, Bond, Writing, Mimeograph, Ledger, Eggshell, Cover and Music Papers, Index Bristol, Post Card and Label Papers

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BLEACHED SULPHITE AND SODA PULP
BLEACHED AND UNBLEACHED KRAFT PULP

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Tyrone, Pennsylvania
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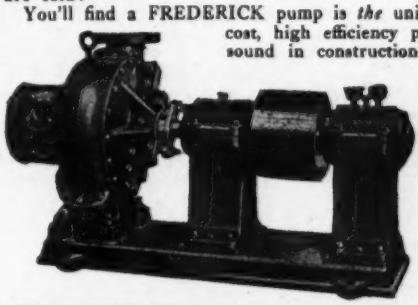
Actually, there is no such thing as a "stock" FREDERICK Stock Pump . . . there is only a basic design. And, when we engineer your pump, we take into account the nature of the stock, its consistency, the piping layout, and all other factors that enter into your operating conditions . . . and build the pump accordingly.

Consequently, FREDERICK pumps can be GUARANTEED to meet the operating conditions for which they are sold!

You'll find a FREDERICK pump is *the* unit for low cost, high efficiency pumping—sound in construction—dependable in operation—proved by over a quarter century's use by leading paper mills.



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Paper Bag Machines, Aniline & Oil-Ink Presses, Waxing, Gluing, Varnishing, Laminating Machines.

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New York. N. Y.

SCREENS of Perforated Metal

The Harrington & King PERFORATING Co.
5252 Fillmore St. Chicago Ill. 114 Liberty St. New York, N.Y.

Old Rags

White, No. 1—			
Repacked	*3.80	"	—
Miscellaneous	*3.20	"	—
White, No. 2—			
Repacked	*2.90	"	—
Miscellaneous	*2.65	"	—
Third and Blues—			
Repacked	*2.20	"	—
Miscellaneous	*1.80	"	—
Roofing Rags—			
No. 1	*1.55	"	—
No. 2	*1.45	"	—
No. 3 (bagging)	*1.35	"	—
No. 4	*1.35	"	—
No. 5A	*1.35	"	—
Old Manila Rope	5.75	"	—

OPA Maximum Prices.

Foreign Rags

All Prices nominal

New Rags

New Dark Cuttings	2.25	@	2.40
New Mixed Cuttings	2.00	"	2.20
New Light Silesias	5.50	"	5.75
Light Flannelettes	5.50	"	5.75
New White Cuttings	7.00	"	7.50
New Light Oxfords	4.00	"	4.50
New Light Prints	3.00	"	3.25

Old Rags

No. 1 White Linens	7.50	"	8.50
No. 2 White Linens	6.50	"	7.50
No. 3 White Linens	4.50	"	—
No. 4 White Linens	2.25	"	3.25
No. 1 White Cotton	4.25	"	4.75
No. 2 White Cotton	3.25	"	3.75
No. 3 White Cotton	2.50	"	3.00
No. 4 White Cotton	1.90	"	2.20
Extra Light Prints	2.00	"	2.40
Ord. Light Prints	1.75	"	2.15
Med. Light Prints	1.55	"	1.95
Dutch Blue Cottons	2.25	"	2.50
French Blue Linens	3.00	"	—
Checks and Blues	2.00	"	—
Linsey Garments	1.90	"	2.00
Dark Cottons	1.50	"	1.60
Old Shopperies	1.30	"	1.45
New Shopperies	1.45	"	1.50
French Blues	2.25	"	2.50

BAGGING

(Prices to Mill, f. o. b. N. Y.)

Gunny No. 1—			
Foreign	Nominal		
Domestic	4.25	@	4.35
Wool Tares, light	4.25	"	4.50
Wool Tares heavy	4.50	"	5.00
Bright Bagging	4.50	"	4.85
Manila Rope—			
Foreign	—	"	—
Domestic	*5.75	"	—
Jute Threads	5.50	"	—
No. 1 Sisal Strings	*4.00	"	—
Mixed Strings	2.00	"	—

* OPA Maximum Price.

Old Waste Papers

(F. o. b. New York)

OPA Maximum Prices

No. 1 Hard White Envelope Cuts, one cut	3.37½	@	—
No. 1 Hard White Envelope Cuts	3.12½	"	—
No. 1 Hard White Shavings, unruled	2.87½	"	—
No. 1 Hard White Shavings, ruled	2.50	"	—
Soft White Shavings, one cut	2.87½	"	—
No. 1 Soft White Shavings	2.50	"	—
Soft White Shavings, Misc.	2.15	"	—
No. 1 Fly Leaf Shavings	1.67½	"	—
No. 2 Fly Leaf Shavings	1.12½	"	—
No. 1 Groundwood Fly Leaf Shavings	1.25	"	—
No. 2 Mixed Groundwood Fly Leaf Shavings	.90	"	—
Mixed Colored Shavings	.75	"	—
Mixed Groundwood Colored Shavings	.90	"	—
Overissue Magazines	1.67½	"	—
No. 1 Heavy Books & Magazines	1.57½	"	—
Mixed Books	.85	"	—
No. 1 White Ledger	2.17½	"	—
No. 2 Mixed Ledger, colored	1.87½	"	—
New Manila Envelope Cuttings, one cut	2.87½	"	—
New Manila Envelope Cuttings	2.65	"	—
Extra Manilas	1.85	"	—
Mixed Kraft, Env. & Bag Cuttings	2.75	"	—
Kraft Envelope Cuttings	3.25	"	—
Triple Sorted, No. 1 Brown Soft Kraft	2.50	"	—
New 100% Kraft Corrugated Cuttings	2.25	"	—
No. 1 Assorted Old Kraft	1.75	"	—
New Jute Corrugated Cuttings	.90	"	—
Old Kraft Corrugated Containers	1.50	"	—
Box Board Cuttings	.72½	"	—
White Blank News	1.65	"	—
Overissue News	.85	"	—
No. 1 News	.75	"	—
No. 1 Mixed Paper	.70	"	—
Old Corrugated Containers	.82½	"	—
Mill Wrappers	.85	"	—

Twines

(F. o. b. Mill)

(Soft Fiber)

Coarse Polished—			
India	.21	@	—
White Hemp	.21	"	—
Fine Polished—			
Fine India	.26	"	—
Unpolished—			
Box	.17½	"	—
Paper Makers	.17	"	—
Tube Rope	.19	"	—
Wall Paper	.20½	"	—
Wrapping	.23	"	—
Soft Fiber Rope	.19	"	—
Cotton	.25	"	—

(Hard Fiber)

Medium Java	.18	"	—
Mex. Sisal	.16	"	—
Manila	—	"	—

PHILADELPHIA

Domestic Rags (New)

(Price to Mill, f. o. b. Phila.)

Shirt Cuttings—			
New White No. 1	.07¼	@	.07½
New White No. 2	.04½	"	.05
Light Silesias	.04½	"	.04¾
Silesias, No. 1	.04	"	.04¾
Black Silesias, soft	.03¾	"	.04
New Unbleached	.07¼	"	.07½
Washable Prints	.03¾	"	.03½
Washable No. 1	.02	"	.02¾
Blue Overall	.04½	"	.05½
Cottons—According to grades—			
Washable shredding	—	"	.01¾
Fancy Percales	.03¾	"	.03½
New Black Soft	.02¾	"	.03
New Dark Seconds	1.75	"	2.00
Khaki Cuttings—			
No. 1 O. D.	.03	"	.03¼
No. 2 Mixed	.02¼	"	.02½
Corduroy	.01¾	"	.02¼
New Canvas	.04¾	"	.05¼
New Black Mixed	—	"	.02½

Domestic Rags (Old)

White No. 1—Repacked	3.80	"	—
White No. 2—Repacked	2.90	"	—
Miscellaneous No. 1	3.20	"	—
Miscellaneous No. 2	2.65	"	—
Thirds and Blues—			
Miscellaneous	1.80	"	—
Repacked	2.20	"	—
Black Stockings—			
(Export)	Nominal		
Roofing Stock—			
Foreign No. 1	Nominal		
Domestic No. 1	1.55	"	—
Domestic No. 2	1.45	"	—
Roofing Bagging	1.35	"	—
Old Manila Rope	5.75	"	—

Bagging

(F. o. b. Phila.)

Gunny No. 1—			
Foreign	Nominal		
Domestic	3.00	"	3.50
Sisal Rope	3.75	"	—
Mixed Rope	.75	"	1.00
Scrap—			
No. 1	3.25	"	3.50
No. 2	1.75	"	1.80
Wool Tares, heavy	4.00	"	4.25
No. 1 New Light Burlap	3.00	"	4.00
New Burlap Cuttings	3.75	"	4.00

Old Papers

(F. o. b. Phila)

OPA Maximum Prices

No. 1 Hard White Envelope Cuts, one cut	3.37½	"	—
No. 1 Hard White Shavings, unruled	2.87½	"	—
Soft White Shavings, one cut	2.50	"	—
White Blank News	1.65	"	—
Soft White Shavings, Misc.	2.15	"	—
No. 1 White Ledger	2.17½	"	—
No. 2 Ledger, colored	1.87½	"	—
No. 1 Heavy Books & Magazines	1.57	"	—
Overissue Magazines	1.67½	"	—
New Manila Envelope Cuttings	2.65	"	—
No. 1 Assorted Old Kraft	1.75	"	—
No. 1 Mixed Paper	.70	"	—
Box Board Cuttings	.72½	"	—
Jute Corrugated Cuttings	.90	"	—
Overissue News	.85	"	—
No. 1 News	1.00	"	—

BOSTON

Old Papers

(F. o. b. Boston)

OPA Maximum Prices

No. 1 Hard White Shavings, unruled	2.87½	@	—
No. 1 Hard White Shavings, ruled	2.50	"	—
Soft White Shavings, Misc.	2.15	"	—
No. 1 Fly Leaf Shavings	1.67½	"	—
No. 2 Fly Leaf Shavings	1.12½	"	—
No. 1 Groundwood Fly Leaf Shavings	1.25	"	—
No. 2 Groundwood Fly Leaf Shavings	.90	"	—
Mixed Colored Shavings	.75	"	—
New Manila Envelope Cuts, one cut	2.87½	"	—
Hard White Envelope Cuts, one cut	3.37½	"	—
Triple Sorted No. 1 Brown Soft Kraft	2.50	"	—
Mixed Kraft Env. & Bag Cuttings	2.75	"	—
Kraft Envelope Cuttings	3.25	"	—
No. 1 Heavy Books & Magazines	1.57	"	—
New Manila Envelope Cuts, one cut	2.87½	"	—
New Manila Envelope Cuttings	2.65	"	—
White Blank News	1.65	"	—
No. 1 Assorted Old Kraft	1.75	"	—
No. 1 Mixed Paper	.70	"	—
Overissue News	.85	"	—
Box Board Cuttings	.72½	"	—
New Corrugated Cuttings, Kraft	2.25	"	—
Old Corrugated Containers	1.00	"	—
Jute Corrugated Cuttings	1.07½	"	—

Bagging

(F. o. b. Boston)

Gunny Bagging—			
Foreign	(nominal)		
Domestic	3.75	@	4.00
Sisal Rope No. 1	*4.75	"	—
Sisal Rope No. 2	*4.25	"	—
Mixed Rope	1.35	"	1.50
Transmission Rope—			
Foreign	(nominal)		
Domestic	2.75	"	3.00
Manila Rope—			
Foreign	(nominal)		
Domestic	5.75	"	—
Soft Jute Rope	4.50	"	5.00
Jute Carpet Threads	3.00	"	3.50
Bleachery Burlap	8.50	"	9.00
Scrap Burlap—			
Foreign	(nominal)		
Domestic	3.60	"	3.85
Wool Tares—			
Foreign	(nominal)		
Domestic	4.25	"	—
Aust. Wool Pouches	4.65	"	4.87½
New Burlap Cuttings	4.75	"	5.00
Heavy Baling Bagging	4.00	"	4.25
Paper Mill Bagging	2.50	"	3.00
No. 2 Bagging	1.35	"	—*

* OPA Maximum Price.

Domestic Rags (New)

(F. o. b. Boston)

Shirt Cuttings—			
New Light Prints	.04½	@	.04¾
Fancy Percales	.04¼	"	.05
New White No 1.	.06¾	"	.07
New Light Flannelettes	.05½	"	.06
Canton Flannels, Bleached	.06	"	.06¾
Underwear Cutters, Bleached	.06¾	"	.06¾
Underwear Cutters, Unbleached	.05¾	"	.06
Silesias No. 1	.06	"	.06¾
New Black Silesias	.03	"	.03½
Red Cotton Cuttings	.03½	"	.04
Soft Unbleached	.06½	"	.06¾
Blue Cheviots	.05½	"	.06
Fancy	.02¾	"	—
Washable	.02¾	"	—
Khaki Cuttings	.02¾	"	.03
O. D. Khaki	.03½	"	.03¾
Corduroy	.03¼	"	.03½
New Canvas	.06¼	"	.06¾
B. V. D. Cuttings	.06¼	"	.06¾

Domestic Rags (Old)

(F. o. b. Boston)

White No. 1—			
Repacked	3.80	@	—*
Miscellaneous	3.20	"	—*
White No. 2—			
Miscellaneous	2.65	"	—*
Twos and Blues, Repacked	2.20	"	—*
Old Blue Overalls	2.25	"	2.50
Thirds and Blues, Repacked	2.20	"	—*
Miscellaneous	1.80	"	—*
Black Stockings	3.50	"	4.00
Roofing Stock—			
No. 1	1.55	"	—*
No. 2	1.45	"	—*
No. 3	1.35	"	—*
No. 4	1.35	"	—*
No. 5, Quality A	1.35	"	—*
Quality B	1.20	"	—*
Quality C	.95	"	—*
Old Manila Rope	5.75	"	—

* OPA Maximum Prices.

Foreign Rags

(F. o. b Boston)

Canvas	(nominal)
Dark Cottons	(nominal)
Dutch Blues	(nominal)
New Checks and Blues	(nominal)
Old Fustians	(nominal)
Old Linsey Garments	(nominal)
New Silesias	(nominal)

CHICAGO

Waste Paper

(F. o. b. Chicago)

OPA Maximum Prices.

Shavings—			
No. 1 Hard White Envelope Cuts, one cut	3.37½	"	—
No. 1 Hard White Shavings, unruled	2.87½	"	—
No. 1 Soft White Shavings	2.50	"	—
Soft White Shavings, Misc.	2.15	"	—
No. 1 White Ledger	2.17½	"	—
No. 2 Ledger, colored	1.87½	"	—
No. 1 Heavy Books & Magazines	1.57	"	—
Overissue Magazines	1.67½	"	—
New Manila Envelope Cuttings	2.65	"	—
No. 1 Assorted Old Kraft	1.75	"	—
No. 1 Mixed Paper	.70	"	—
Box Board Cuttings	.72½	"	—
Jute Corrugated Cuttings	.90	"	—
Overissue News	.85	"	—
No. 1 News	1.00	"	—
No. 1 White Ledger	2.17½	"	—
No. 1 Heavy Books & Magazines	1.67½	"	—
White Blank News	1.65	"	—
Mixed Kraft Env. & Bag Cuttings	2.75	"	—
No. 1 Assorted Old Kraft	1.75	"	—
Overissue News	.85	"	—
No. 1 News	.75	"	—
No. 1 Mixed Paper	.70	"	—
No. 1 Roofing Rags	1.55	"	—
No. 1 Roofing Bags	1.45	"	—